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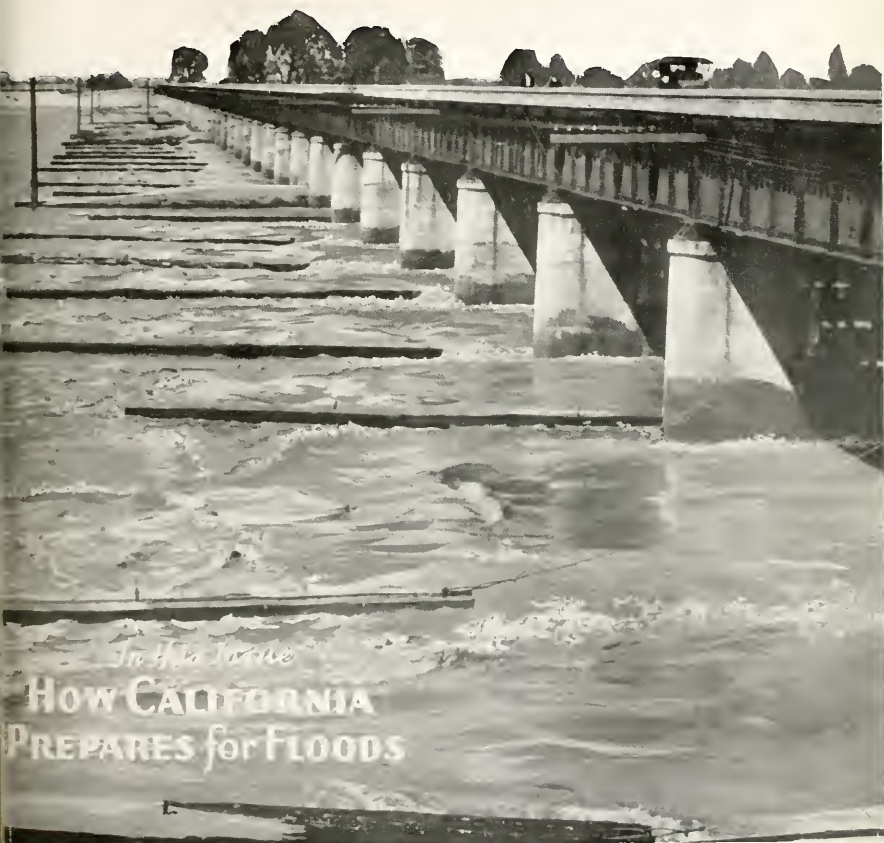
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Yellow Bellum *Reason - No other*

CALIFORNIA HIGHWAYS and PUBLIC WORKS



In His Honor
**HOW CALIFORNIA
PREPARES FOR FLOODS**

Official Journal of the Department of Public Works
State of California
JANUARY 1930

FEB 1 - 1930

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How California Prepares for Floods

By R. L. JONES, Deputy State Engineer in Charge of Flood Control and Reclamation.

THE State of California has materially increased its direct interest and activity in the maintenance of flood control works in the Sacramento Valley, where, in a large region of the state, a comprehensive system of flood protection is an accomplished fact. This has been brought about in connection with the revised flood control project plan, and the recent legislation of the state and the United States, in which the financial participation of both governments in the project has been substantially increased. The assumption of responsibility by the state, for a limited period, for the maintenance of flood control works, is a part of



R. L. JONES.

an active program of the state government for relieving the financial difficulties of the landowners within the project. It looks toward the liquidation of the large outstanding indebtedness, which has deeply involved the lands for a number of years.

Legislation and Appropriations.

As a matter of information, the arrangement being comparatively new, the details of the state legislation and appropriations in respect to this maintenance are set out rather fully below.

The Sacramento and San Joaquin Drainage District includes the lands in the Sacramento and San Joaquin valleys subject to inundation by flood waters and was created by the legislature in 1913. In 1927 the legislature, by the enactment of chapter 774, directed that the operation and maintenance of certain units or portions of the flood control works within the Sacramento and San Joaquin Drainage District in the Sacramento Valley shall be under the direction and control of the Department of Public Works and that the cost of such operation, control and maintenance shall be defrayed by the state. The act was amended slightly in chapter 387, Statutes of 1929, which provides that this arrangement shall continue for eight years, or until August 14, 1937.

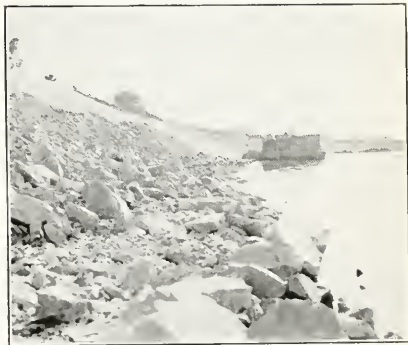
The flood control works specifically placed

in charge of the Department of Public Works are as follows:

- (1) The east levee of the Sutter By-pass north of Nelson Slough.
- (2) The levees and channels of the Wadsworth Canal, the intercepting canals draining into the same, and all structures incidental thereto.
- (3) The collecting canals, sumps, pumps and structures of the drainage system of Project No. 6 east of the Sutter By-pass.
- (4) The by-pass channels of the Butte Slough By-pass, the Sutter By-pass, the Tisdale By-pass, the Yolo By-pass, and the Sacramento By-pass with all cuts, canals, bridges, dams, and other structures and improvements contained therein and in the borrow pits thereof.
- (5) The levees of the Sacramento By-pass.
- (6) The channels and the overflow channels of the Sacramento River and its tributaries within the Sacramento and San Joaquin Drainage District.
- (7) The Sacramento River outlet enlargement project below Cache Slough to the extent of the state's liability thereof.

These acts further state:

The Sacramento and San Joaquin Drainage District and the Reclamation Board and the members thereof, during said period, are hereby relieved of all responsibility or liability for the operation or maintenance



Levee revetment of quarry rock.

of all levees, overflow channels, by-passes, weirs, cuts, canals, pumps, drainage ditches, sumps, bridges, basins, or other flood control works within or belonging to the Sacramento and San Joaquin Drainage District.

The passage of this law places upon the Department of Public Works the entire responsibility, so far as the state is concerned, for the maintenance of the physical works of flood control. It imposes upon the Department the duty of maintaining and operating

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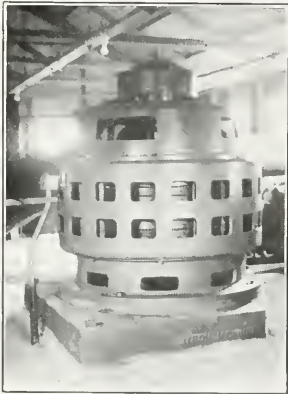
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the specific project units enumerated, which include, as near as the segregation can be practically made, all of the works of the Sacramento and San Joaquin Drainage District constructed for flood control purposes as distinct from reclamation. It was the intention to limit the expenditure of state funds to the maintenance of "flood control works."

Section 7 of the Reclamation Board Act was amended by chapter 343, Statutes of 1925, to include the following paragraph:

The operation, control and jurisdiction of all weirs on the Sacramento River, so far as the State of California is concerned, shall be under the direction of the Division of Engineering and Irrigation, Department of Public Works.

This has special application to the Sacramento Weir, which is the only one now built



Sutter By-pass, 300-h.p. vertical motor driving a 42-inch pump.

on the project requiring operation, the others functioning automatically. The maintenance of the weir structures is cared for by the Federal Government through the California Debris Commission.

The sum of \$150,000 to defray the cost of flood control project maintenance, was provided by chapter 766, Statutes of 1927, "to be expended by and under the direction of the Department of Public Works in the operation and maintenance of such of the flood control works of the Sacramento and San Joaquin Drainage District as by law may be imposed on the State of California." This appropriation was expended from September, 1927, to July 1, 1929.

Provision of funds for maintenance and operation for the current biennium is made



Timber toedam to prevent undercutting of levee.

in the budget appropriation act of 1929. This act provides as follows:

For maintenance, operation and emergency protection of the Sacramento flood control project, including the purposes contained in section 2, chapter 771, Statutes of 1927—two hundred thousand dollars (\$200,000).

Funds for emergency protection and co-operative bank protection work on the Sacramento River system are obtained from the above maintenance appropriation. It is contemplated in the revised project plan, which is the report of the California Debris Commission, dated January 5, 1925, that the cost of maintenance shall be divided practically as is the cost of the project, that is, one-third each to the state, the United States and the local property owners. The state appropriation of \$100,000 per year matches an equal amount made available by the Federal Government to the California Debris Commission for maintenance, both including bank protection work. It is presumed that local interests will expend an equal amount, making a total of \$300,000 per year. Whether or

(Continued on page 25.)



Tree current retard or deflector.

The Why of Your License Plate; It's Easy Now to "Get Your Number"

By B. A. TRAVIS, Assistant Chief Clerk, Division of Motor Vehicles.

THERE'S a story behind the yellow and black automobile license plates which have begun to make their appearance in such large numbers on California highways since the Division of Motor Vehicles began its final license renewal drive.

These plates may not appeal to you as being either dainty or even pretty. The rather crude black letters stand out boldly against a background of deep yellow, giving a lasting impression, but rather lacking in artistic appeal.

They are not meant to be pretty. Their function is not to ornament the car displaying them, but to identify it. More than any other thing, have they served in the year just past to bring the "hit and run" driver to justice.

EXPERIMENTS MADE

Recognizing the inadequacy of the style of plate being used at the time he assumed office, Chief Frank G. Snook undertook a series of experiments to determine what style would provide the greatest degree of visibility.

Up to that time a small, rather aristocratic-looking plate had been used. When registrations increased beyond the million mark it became necessary to put seven numbers on one plate. The old plate was rather pretty, but it took a keen-eyed traffic officer to read it on a



The new and the old system of numbers, showing the greater visibility of the new system.

moving vehicle for a distance of more than fifty feet.

"Hit and run" accidents were frequent with the old plate. A few feet away and the driver was safe because no one could read his number.

GOVERNOR APPROVES PLATE

After casting about for several months Snook chose a plate modeled closely after the style adopted in New York. The choice met with the enthusiastic approval of Governor C. C. Young and the plate was adopted.

Colors of deep yellow and dull black were chosen as the combination with the greatest visibility. Yellow letters with a black background were used in 1929. These colors were reversed this year, providing a yellow background with black letters. Next year they will be reversed again to provide the same arrangement as in 1929.

The new plate is much larger than the old one, being 13½ inches in length and 6½ inches in width. It is of much heavier steel, and the old border that formerly detracted so much from visibility has been replaced by an inverted bead that will provide greater rigidity.

LETTERS CHANGED

The big change is in the lettering system. If you watch cars on the roads closely you will



Comparative visibility at 50 feet distance; old plate on left of auto, new plate on right.

observe no plate has more than six characters on it. Memory training lessons are not necessary for officers any more.

By using the combination of letters and numerals it is possible to provide for a registration of 2,070,000 without exceeding six characters on the plate.

Under the new system, the lowest number issued by the state has three characters. The first plate is number 1A1. They run from that to 9A9-999. The series then shifts to 1B1 and go up to 9B9-999 and so on through the alphabet to 9Z9-999.

The letters I, O and Q were left out because of their resemblance to the numbers one and naught.

NUMERALS ARE LARGE

These letters and numerals purposely are big enough to fairly shriek the identity of the driver. They are three and three-quarter inches in height.

There is a reason for putting the words "Cal" and "30" in inconspicuous positions. They were made small purposely so as not to detract from the visibility of the numbers.

Actual tests made on the roads show the new numbers can be read nearly three times as far away as the old ones.

Traffic officers reported a larger number of arrests of hit and run drivers last year than ever before. Fewer mistakes were reported in the reading of numbers. Drivers naturally reckless were made more cautious by the knowledge that they could be identified more easily.

Realizing this, lawbreakers have resorted to the practice of smearing their plates with grease and mud to make them illegible. Others conceal them partly behind spare tires or bumpers. Officers of the California Highway Patrol have been ordered to watch for such violations and to arrest any person caught driving with dirty or obscure plates.

KEEP PLATES CLEAN

In this connection, the division has issued a warning calling the attention of the motorists to a section of the law requiring that plates be exhibited on the car at a point not less than 24 inches from the ground.

Plates must also be fastened to the car in horizontal position. It is not legal to display them in a vertical position or at an angle, and they must be securely fastened.

It is now illegal to drive on any public highway with 1929 plates unless the driver can show he has made application for new plates.

After January 31st, drivers who have not applied for the new plates will have to pay

double. In the case of an ordinary passenger car this means a fee of \$6 instead of \$3. For commercial vehicles it means much more.

Motorists who have not done so should lose no time, therefore, in applying for new plates.

The renewal season now closing will exceed all previous records.

MUST PAY FEE

Another requirement for registration is that motorists must pay the \$1 transfer fee if they have made the final payment on the car during the year and have become the legal owner. Signing over of the pink certificate by the finance company or dealer actually means that ownership of the car has been transferred and this must be noted in the records of the division of motor vehicles.

Besides its main office in Sacramento, the division has six branch offices located, respectively, in Oakland, San Francisco, Fresno, Los Angeles, Long Beach and San Diego. This year's run of plates has been so apportioned to these branches that it will be almost possible to tell where a motorist is from by the letter and number of his license plate.

For example, a half million plates, running in numbers from 1A1 to 5F9-999 have been assigned to Sacramento for immediate delivery while numbers from 6F1 to 9F-999 have been assigned to the same office for open or later deliveries.

PLATES ASSIGNED

Numbers from 1G1 to 6H9-999 go to Oakland, while San Francisco will get numbers from 7H1 to 7K9-999. Fresno gets numbers from 8K1 to 9L9-999.

Los Angeles where the counter registrations are heaviest received everything from 1M1 to 9X9-999. Long Beach received numbers from 1Y1 to 9Y9-999.

The Z numbers, that is, everything from 1Z1 to 9Z9-999, of which there are 90,000 will be distributed to San Diego motorists.

California's example in adopting license plates that can be read is being followed in many other states.

Everywhere, state officials are reaching the conclusion that number plates have but one purpose—to identify the owner and driver of the vehicle.

A Chicagoan visiting Fond du Lac, Wis., had occasion to call Appleton. Upon asking what the charge was, he was told fifty cents.

"Fifty cents. For that distance? Great Scott! In Chicago you can call hell up for fifty cents."

"Possibly," coolly answered the operator, "It's in the city limits."

Problems in Road Building that California is now Investigating

By T. E. STANTON, Member A. S. C. E., Materials and Research Engineer.

THE comparatively recent advent of the motor vehicle occasioned the development of the new science known as "Modern" road building.

Road building, as such, is one of the oldest sciences. In the days of the horse drawn vehicle and slow transportation, however, the need and demand for good roads was relatively limited. The great increase in the wealth of the country and consequent astounding increase in volume and speed of vehicular traffic has occasioned a demand for good roads. The volume of expenditures and importance of the work justifies a thorough investigation and study of improved methods of construction to the end that greater ultimate value may be received for each dollar expended.

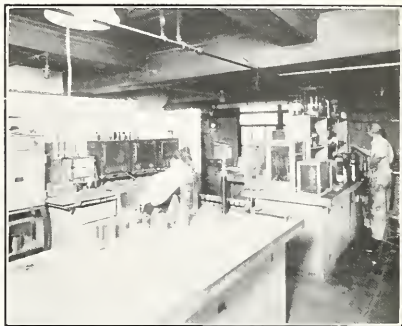
We are living in an era of Highway Research, and California, through its State Highway Department, has contributed its share towards the successful development of improved methods of construction and maintenance.

In carrying out this program over sixty special lines of investigation have been carried on during recent years. Many important investigations are now under way.

Some of the most important of these active investigations are the following:



Coarse aggregate department, showing abrasion, crushing and screening equipment.



One end of the asphalt testing department.

1. Study of Concrete Curing Methods.

The accepted method of curing concrete has been by keeping it moist with water usually for a period of ten days or more. Curing by water, however, frequently offers considerable difficulty and expense. Alternative methods of curing by means of an impervious membrane of asphalt, paper-sodium silicate, etc., have been offered and are being thoroughly investigated by this department. Pavements are cured by the different methods and cores cut and tested to determine, if possible, the relative strength secured. A number of sections have been constructed and are now under close observation. In order that the results may be comparable close control must be kept of the proportioning, mixing, and curing operations. Complete records must be kept of slump of the concrete and of the atmospheric conditions during and subsequent to construction.

2. Study of Metal Culvert Performance.

Four years ago a study was commenced of the condition of the corrugated metal culverts which have been installed on the State Highway System. The condition of some 5000 culverts was investigated at that time. This study has been continued and will be continued in the future to determine, if possible, the probable life of culverts made of

metals of different chemical composition. Methods of installation, maintenance, climatic conditions, etc., are being thoroughly studied.

This study has already brought about improved methods of culvert construction and maintenance which will materially increase the life of metal culverts, thus amply justifying the cost of the investigation.

3. *Admixture Tests.*

Extensive laboratory and field investigations are being conducted to ascertain the effect of various percentage admixtures of silica dust, pumicite, tale, and diatomaceous earths.

Advantages claimed for admixtures are improved workability and strength of concrete.

4. *Reinforcement in Concrete Pavements.*

Several test sections have been constructed and are now under observation.

5. *Impact Tests for Rock and Gravel.*

Studies are being made to devise an improved method of determining the quality of coarse aggregate for pavement construction.

6. *Studies of Hydration and Causes for Disintegration of Cement Concrete.*

This investigation is being conducted by our chemical department and is of particular importance in connection with concrete dam construction.

7. *Expansion Joint Materials.*

There is need of an efficient and durable expansion joint. Progress is being made in this direction.

8. *Development of a Quick Hardening Concrete.*

There is frequent need of opening concrete pavement to traffic at an early period after construction. Investigation is being made of the different special brands of cement on the market for this purpose and also relative to methods of using standard local brands for the same purpose.

9. *Study of Light Oil Mix Surfaces.*

Studies are being made relative to the best design of an oil mix as regards grading, oil content, etc.

The successful application of this relatively cheap method of construction has made possible the early improvement of many miles of desert roads at a low cost.

10. *Stability Tests of Asphaltic Concrete Mixtures.*

A great deal of thought at the present time is being given to the design of asphaltic concrete mixtures and the devising of methods of making accelerated laboratory tests which will determine the probable stability of such mixtures. Properly designed asphaltic mixtures should give many more years of service without excessive maintenance as compared with improperly designed mixes.

11. *Development of Accelerated Tests for Determining Quality and Durability of Traffic Line Lacquers.*

Work done to date has resulted in specifications for a high grade of traffic line lacquer with a resultant material saving in renewal costs.

12. *Development of Equipment for Measuring the Relative Coefficient of Friction in Bridge Expansion Plates Due to Differences in Finish and Character of Metal.*

Considerable progress is being made in this work. There is promise of development of procedure which will result in an ultimate saving both in original construction and subsequent maintenance and reconstruction costs.

13. *Non-Corrosive Coatings for Steel Bridge Members.*

An investigation is being made of the value of the various so called noncorrosive metal paints on the market. These tests are being made under adverse field conditions in a location close to the sea.

14. *Fillers for Asphaltic Concrete.*

Lime rock dust or Portland cement have, in the past, been specified as fillers in asphalt mixtures. Investigation is being made relative to the merits of other commercial fillers with a possibility of saving in construction costs.

15. *Miscellaneous Investigations and Studies of a Relatively Minor Nature Which Are Under Way May Be Mentioned as follows:*

(a) Comparative strengths of different brands of California cements.

(b) Field tests for determination of adverse soils.

(c) Strain gauge design and studies.

(d) Development of method for analysis of graphite paint pigments.

(Continued on page 27.)

Making the Prisons Safe at Night

By W. K. DANIELS, Deputy Chief of the Division of Architecture.

THE problem of the control of prisons is a twofold one, involving two very separate and distinct situations.

There is the problem of day discipline, when prisoners are assigned to various tasks, and when of necessity the measure of their liberty is greatly increased.



W. K. DANIELS.

Then there is the problem of night control, a problem much easier of solution than that of day control of prisoners, but which nevertheless presents difficulties of a character peculiar to itself.

It is in the problem of housing criminals that the Division of Architecture enters.

Prior to the housing of the criminal, there is, of course, the period of his capture and trial.

Radio equipped police stations may have had a part in the capture of the criminal, and cruisers and scout cars have patrolled the city in his search. The man hunt is well under way in a few minutes time. Capture of criminals is so certain that arrangements for their housing must be made months in advance of their crimes.

Housing of criminals demands their safe custody. The problem of their safe custody at night has been better solved than that of day control. It is noteworthy that the numerous prison riots and attempted "breaks" that have occurred in various parts of the country recently have taken place during the daytime. Why? Because when the prisoners are locked up for the night, they stay locked.

The Division of Architecture plays an important part by planning cell houses to make good this factor of night safety. At this particular time, the state through the Division of Architecture, is constructing a new unit at the Folsom State Prison. This

unit consists of a cell block, hospital and administration building.

During the daylight hours and in fair weather, all prisoners except those in solitary confinement, are released from the cell house and are detailed to work, some to constructions, others to the quarry, power house, gardens, grounds, etc. One finds prisoners incarcerated for various crimes ranging from petty larceny to murder scattered to all parts of the institution grounds. During this period of the day, escapes are prevented by the river and high walls, which are commanded by elevated towers containing armed guards.

When night comes the whole prison population is placed in cells and locked up. It



New cell block hospital and administration unit, Folsom State Prison.

is obvious that these cell buildings must be escape-proof for here you have a concentration of several hundred men, many of them desperate characters.

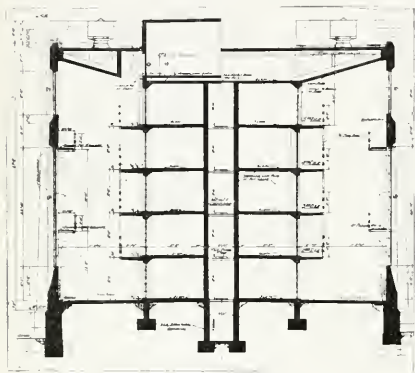
What might they not accomplish toward destruction and death under cover of darkness, if the cell buildings were not given thorough study as to planning and construction of absolute soundness and escape-proof?

A cell block is composed of a series of tiers erected inside of a fully enclosed building and constructed of heavily reinforced concrete. Should by any chance a convict free himself from his cell he would still be confined within a strong building.

The new cell block at the Folsom State Prison when completed will contain 310 cells being in tiers of five high and with a distance of 8 feet from tier to tier. The cells are constructed back to back having a utility chamber

separating them which contains the various plumbing pipes and ventilation ducts. The cells are 4 feet 6 inches wide and 11 feet long. Each contains a bed, lavatory and toilet fixture and each cell has mechanical ventilation. The cell fronts are built of heavy steel grilles having a grille door. Entrance to the cell is from balconies along the cell fronts, which serve the stairways at each end of the tiers. The cell doors, besides having a separate lock on each door, are securely locked by a heavy continuous steel bar dropped down in front of the door at the top which is free from any attempted tampering from the cell. This bar is controlled with a lever arm at one end of the tiers and secures all doors simultaneously.

The windows in the building covering the cell tiers are constructed of steel sash and



Section through new cell block, Folsom State Prison.

frames giving an abundance of natural light. By reason of the fact that certain sections of the windows open with awning type operators, plenty of air can be admitted when desired. It is needless to say that heavy steel bar grilles, embedded in the concrete walls on the outside, protect these window openings from any possible escape.

On the interior of the walls of this building completely surrounding the cell tiers are two guard galleries, constantly patrolled at night, which makes possible observation and control of the cells at all time. The guard galleries can not be reached from the cell balconies.

Convicts as other persons require medical attention, so a hospital building is very important and is a part of the unit comprising the new cell block. The Division of Architecture has planned a new modern

prison hospital which is being constructed. The plans for this hospital unit have been drawn to permit the best arrangement for dental, medical and surgical care, bearing in mind also the safety of the attendants handling the convicts while confined to the hospital.

This building is also constructed of heavily reinforced concrete being a three-story structure. The first floor contains a pharmacy, a laboratory with a vault for the storing of narcotics, etc., record room, doctor's office, clinic containing operating table, dentist chair, sterilizers, dark room, etc. On the second floor is a medical ward, kitchen, diet kitchen and serving pantry, dining room and quarters for nurses and attendants. On the third floor are two operating rooms having in conjunction with them an instrument room and sterilizing room, an acute surgical ward, a fracture room, doctor's washup and dressing rooms and rooms for fluoroscopy and radiography.

The present Administration Building was constructed prior to the year 1900. Not only has it become obsolete, but it is not located in the proper position that an Administration Building should be. This is due to the growth of the prison beyond the original plan.

The 1929 legislature approved an appropriation which authorized the construction of a new Administration Building. This construction is now being accomplished, as a unit of the new cell block and hospital building, comprising an extension of the same.

The new location is closer to the main entrance gate of the prison proper. The extension portion will be a two-story structure of the same type of construction as the other parts of the unit. The administration quarters will be on the first floor and will include an entry and reception room, warden's office, office for the secretary to the warden, board room, office for clerk of the board, room for narrative writers, files, barber shop, visiting room and prisoners' tank separated with a steel grille and screen to prevent a personal contact between visitors and prisoners, a mail department, telephone exchange, room for auditor, and a room for auditor's clerks having a file room and vault.

The second floor portion will be an extension of the hospital and will contain a medical ward, pulmonary ward, dining room and eight cells. A portion of this structure will contain a basement where the morgue will be located as well as an execution chamber.

The hospital and administration units are served with an elevator, stairways and corri-

New Location on The Ridge Route Unsurpassed for Mountain Alignment

A DECISION to relocate a section of the Ridge Route on the state highway between Los Angeles and Bakersfield, which has reached its maximum economic travel capacity, and which has proved excessively hazardous to travel, was announced by the California Highway Commission at its December meeting. Bids will be asked within the next few weeks on the first section of the relocated highway.

The decision to relocate the highway was reached after exhaustive studies by the Department of Public Works, showing that the

ment is evidenced by the fact that it will have a total of 7500 degrees of curvature against a total of 35,140 degrees on the present route.

While the capacity of the present road is overstressed by 1500 vehicles daily, due to its numerous grades, its almost continuous and sharp curvature, the large volume of slow moving heavy hauling traffic that uses it, the new road will have a safe and comfortable capacity of 12,000 or more a day, and its alignment standard will be such that when traffic justifies increased width it can be done without distorting that standard.

COMPARISON OF PRESENT HIGHWAY AND PROPOSED ALTERNATIVE

	Proposed route	Present highway	Difference favoring new route
Length	28.5 miles	35.8 miles	7.3 miles
Highest elevation.....	3550 feet	4234 feet	684 feet
Total rise.....	3350 feet	4630 feet	1280 feet
Adverse grade.....	940 feet	2220 feet	1280 feet
Minimum radius curve.....	1000 feet	70 feet	
Maximum grade.....	6% compensated	*6% uncompensated	
Minimum width roadway.....	36 feet	25 feet	
Total central angles in curvature.....	7500 degrees	**35,141 degrees	

* 6% grade has been greatly exceeded in short stretches where realignment has cut distances on curves.

** This is original alignment data. Reconstruction has probably reduced angles about 25%.

traffic load on the present location was costly of maintenance and operation; that the accident record on it was excessively high; that it fails to meet the traffic requirements of the present; and that these conditions could not be remedied by further expenditures on the same location.

ALIGNMENT UNSURPASSED

The new highway will be built to modern standards of construction with low maintenance cost and capable of meeting present and future traffic requirements. Engineers of the Department of Public Works state that its alignment for mountain construction will be unsurpassed by any in the United States. This remarkable character of the new align-

ment is evidenced by the fact that it will have a total of 7500 degrees of curvature against a total of 35,140 degrees on the present route. While the capacity of the present road is overstressed by 1500 vehicles daily, due to its numerous grades, its almost continuous and sharp curvature, the large volume of slow moving heavy hauling traffic that uses it, the new road will have a safe and comfortable capacity of 12,000 or more a day, and its alignment standard will be such that when traffic justifies increased width it can be done without distorting that standard.

PROVIDES SAFE ROADWAY

An important factor in determining upon relocation at the present time was the excessively high percentage of accidents on the Ridge Route, due to alignment and an overstressed travel condition. In addition to remedying these faults, the new location will be free from much of the fog, sleet and snow with which present routing contends. It lies in average lower and more protected position.



Upper heavy line shows new route adopted for state highway on Ridge Route; lower barred line shows present location.

Under agreement with the board of supervisors of Los Angeles County, the present route will be taken into the Los Angeles County road system, and with the opening of the alternate route, the state will be relieved of further maintenance costs upon it.

The change has been approved by Attorney General Webb.

LOCATION OF NEW SECTION

The termini of the relocated road will be at Castaic on the present highway to a reconnection with the state highway at Gorman, near Tejon Pass, a distance of 26 miles, and will effect a saving of 7.3 miles over the present route.

Exhaustive engineering study demonstrated that the most practicable location for this important artery connecting northern and central California and the region south of the Tehachapi Range is controlled by the Tejon Pass. The new location south of this pass differs from the present location by following drainage courses for a more direct southerly descent instead of traversing the ridges from which sudden descents must be developed on inferior grade and curvature. Thereby distance, curvature, adverse grades and steep grades are all reduced.

The grades on the alternate route are far more uniform and will have 1280 feet less elevation in rise and fall than the existing highway. The grade rates will be satisfactory for high gear operation.

The minimum radius of curvature will be 1000 feet, a sweeping alignment satisfactory for legal speed limits. This curvature gives long distance with consequent safety and relief from the strain of guarding against surprises on the sharp curves that characterize the present road, on which a number of curves are built with a radius as sharp as 70 feet.

Traffic census shows a 40 per cent increase in travel over this section in the past three

years, greatly overstressing the maximum economic capacity of the road. It is estimated that present travel will increase 175 per cent in the next ten years.

The Ridge Route was constructed in 1914 as one of the first projects undertaken by the California Highway Commission. The total motor vehicle registration of the state in that year was 125,516 as compared with a present registration of 2,015,418. The road follows the combs of the mountain ridges, adhering to contour alignment for economy in grading, in keeping as near as possible to the top of the ridges, several false summits are encountered on the route. Attempts to improve alignment have been made in the past at heavy cost, but the improvements have failed to do more than temporarily remedy defects, inherent in the original location. On the present routing, it has been found impossible to eliminate the general character of the continuous swing of reverse curves. The road is a marked example of the impossibility of adequately modernizing a location in a heavy mountain district with maximum grade on tortuous alignment. The condition of the road makes it unnecessarily detrimental to the proper flow of travel between northern California and the San Joaquin Valley on the one hand and Los Angeles and southern California on the other.

The new route lies west of the present Ridge Route. It starts near Castaic Post Office. After crossing a flat country for several miles, it begins its ascent on the west side of the canyon to pass over a saddle into Violin Canyon. The route crosses Violin Canyon to Violin Summit; thence it crosses Canton Creek and Oso Creek, and ascends Piru River and Liebre Creek to the divide between Liebre and Alamos Creeks. Thence it follows valley up Alamos Creek to a point 3 miles north of Bailly Patrol Station on the present road. It effectually eliminates the portion of the Ridge Route containing the worst features of that road.

U. S. Supreme Court Okehs California Tax Laws on Gasoline-Motor Vehicles

THE UNITED States Supreme Court on November 25, 1929, handed down a decision upholding the legality of California's gasoline tax laws.

The decision, which was rendered by Justice McReynolds, was as follows:

By acts approved July 11, 1916, chapter 241, 39 Stat. 355, and November 9, 1921, chapter 119, 42 Stat. 212 (23 USCA § 1 et seq.), Congress provided for aid to the states in roadmaking and directed that "all highways constructed or reconstructed under the provisions of this act shall be free from tolls of all kinds." 23 USCA § 9. California assented to the provisions of these acts and under them received large sums of money from the United States.

By the motor vehicle fuel tax statutes, chapter 267, Acts 1923, chapter 359, Acts 1925, and chapters 716, 795, Acts 1927, the California Legislature defined motor vehicle fuel, and directed that all distributors of it should be licensed and pay taxes to the controller of the state, amounting to three cents per gallon sold, less an allowance of 1 per centum. These statutes further provide for reimbursing purchasers of fuel not used for operating vehicles upon public highways.

Appellants, along with thousands of other citizens and taxpayers of California, operate motor vehicles along the highways. They have procured and must hereafter procure the necessary fuel from licensed distributors at prices enhanced by the amount of the three-cent tax.

The original bill, filed in the District Court of the United States, August 4, 1928, names as the only defendant the State Controller—the officer charged with the duty of enforcing the motor vehicle fuel tax statutes. It proceeds upon the theory that those statutes, under the form of taxing dealers from whom appellants and all other operators of motor vehicles must buy, in effect exact tolls for the use of the highways, also grant certain favors to the distributors, and deprive all such purchasers of their property without due process of law. Therefore, it is said, they conflict with the Fourteenth Amendment, the Federal Highway Acts, and the Constitution of California. The prayer is for a decree declaring their invalidity and for an injunction restraining defendant from attempting to enforce them, etc.

In the court below—three judges sitting—the bill was dismissed, without written opinion.

(1) Appellants may not undertake to test the validity of the questioned acts by a proceeding of this character. *Frothingham vs. Mellon*, Sec'y of the Treasury, 292 U. S. 447, 487, 488, 43 S. Ct. 597, 601, 67 L. Ed. 1078, announces the applicable doctrine:

"The administration of any statute, likely to produce additional taxation to be imposed upon a vast number of taxpayers, the extent of whose several liability is indefinite and constantly changing, is essentially a matter of public and not of individual concern."

The Federal courts have no power *per se* to review and annul acts of state legislatures upon the ground that they conflict with the Federal or state constitution. "That question may be considered only when the justification for some direct injury suffered or threatened, presenting a justifiable issue, is made to rest upon such an act."

The decree below is affirmed.

The Chief Justice, Mr. Justice Van Devanter and Mr. Justice Butler are of opinion that the appellants' status is such as entitles them to test the validity of the California statutes in question; that these statutes do not exact tolls for the use of highways within the meaning of the limitation contained in the Federal Highway Acts, and are not subject to the other objections urged against them; and that for these reasons the decree below should be affirmed.

TRANSPORTATION TAX UPHELD

On the same day the Supreme Court of the United States also upheld the legality of the tax imposed by California on carriers by motor vehicles over regular routes. In this decision the Supreme Court held that "A state statute imposing upon common carriers engaged in transporting freight by motor vehicles along public highways between fixed termini and over regular routes a tax of 5 per cent of their gross receipts, in lieu of all other taxes, is not unconstitutional as class legislation, though other freight carriers, common and private, by motor vehicles, are subjected to different and less burdensome taxation."

TEXT OF DECISION

The decision in full follows:

Appellants, as common carriers, are engaged in transporting freight by motor vehicles for hire along public highways between fixed termini and over regular routes within California. The 1926 amendment to the constitution and the statutes of that state lay upon such carriers a tax of 5 per cent of their gross receipts in lieu of all other taxes, while other freight carriers, common and private, by motor vehicles, are subjected to different and, it is alleged, less burdensome taxation. Cal. Const. art. 13, § 15; March 5, 1927, chap. 19, 1927 Cal. Stat.

By this proceeding, instituted July 21, 1928, appellants ask that the constitutional amendment and the statute which undertake to lay such tax upon them be declared discriminatory and in conflict with section 1 of the fourteenth amendment; also, that an injunction issue against the State Comptroller, forbidding him from attempting to enforce payment.

Upon motion, without written opinion, the district court—three judges sitting—dismissed the bill. The

Epochal Grade Crossing Decision Rendered by State Railroad Board

THE most important grade crossing decision in the history of California was handed down on December 7, 1929, by unanimous decree of the State Railroad Commission. The decision involved a grade crossing on the Bayshore Highway over a spur track of the Southern Pacific near San Mateo.

The California Highway Commission and the Department of Public Works opposed any grade crossing on this highway. The Southern Pacific held that the fact that the track was simply a spur track removed objection to its presence.

The issue was submitted to the Railroad Commission by agreement between the parties.

The decision of the Railroad Commission completely upheld the contention of the state that the Bayshore Highway should be kept free of all railroad grade crossings.

The mooted question of the priority of highway and railroad rights at the particular crossing was settled by the Railroad Commission distributing the cost of the overhead railroad structure, ordered by it between the state and the Southern Pacific on a fifty-fifty basis.

TEXT OF DECISION

The decision of the California Railroad Commission in full follows:

The Department of Public Works of the State of California, through its director, raised the question as to whether or not this Commission could afford the department any relief in connection with a controversy which had arisen between it and Southern Pacific Company, in connection with the construction of a new state highway (Bay Shore) over a disconnected spur track built by Southern Pacific Company near the southerly limits of the city of San Mateo. Thereupon the Commission, on its own motion, instituted an investigation into the installation, maintenance, protection and operation of said crossing. Hearings were held at San Francisco on October 18th and 20th, at which time both parties agreed to submit to the Commission, for determination, the question as to how the projected crossing between the railroad and highway should be effected and apportion the cost of the same.

The Bay Shore Highway is being constructed for the purpose of providing, in advance of development, a thoroughfare which can be maintained as a permanent high-speed artery to ultimately connect the city of San Francisco with San Jose by a route along the westerly shore of San Francisco Bay, which is, in general, at some distance from the built-up section of the peninsula. With the intense development of this

territory the need of this artery will be far greater than at present and it has been located so as to avoid the delays incident to travel over El Camino Real, the present state highway. If this purpose is to be accomplished, there must be a minimum of obstructions by the cities en route and by other agencies.

The highway has been constructed and is now open to travel between San Francisco and Fifth avenue, in the city of San Mateo. Beyond Fifth avenue, the proposed route follows a dedicated public street for a short distance and then continues across private property, known as the Emma Rose Estate. The state, at the present time, owns no right of way across the Emma Rose property but, on April 16th of this year, filed a condemnation suit against Emma Rose and Southern Pacific Company. It has declared its intention to construct the highway southerly from Fifth avenue to Palo Alto during the next year.

Southern Pacific Company has, for some time, carried on negotiations with the Emma Rose Estate for the construction of a spur track into the property to be developed for industrial purposes. On March 18, 1929, a fifty-foot right of way for a spur track, connecting with the main line of Southern Pacific Company near its Leslie Station, was deeded to Southern Pacific Company and immediately Southern Pacific Company laid approximately 1400 feet of skeleton track on this right of way, a portion of this construction being across the proposed routes of both the Bay Shore Highway and the Western Pacific California Railroad Company, a subsidiary of The Western Pacific Railroad Company. This skeleton track does not connect with any track of Southern Pacific Company and, at its nearest point, is 2200 feet distant from the nearest operative track. The ties on which the rails are spiked are widely spaced; no ballast has been applied and the entire construction is such as to be incapable of being subject to railroad operation even if it were physically connected to operative trackage.

The Commission can not recognize a mere intention of the state or other political body, to acquire a right of way and construct a public thoroughfare, as constituting a public road such as referred to in section 43 of the Public Utilities Act, nor, on the other hand, can it consider a few connected rails and ties, which are incapable of being operated over as a railroad, as being the track of a railroad referred to in that section. In the present case, however, a full and complete record as to the necessity, hazards, terms of installation and manner of crossing, has been developed and, since both parties have submitted the matter to this Commission for decision, it appears appropriate that the Commission finally determine the crossing matter at this time, particularly since it is apparent that both the highway and spur track will be constructed in the near future.

While the evidence in this case shows that for some time to come the switching operations over the railroad would not seriously interfere with the full use of the new highway, yet, if the purpose of the state

in the construction of this highway is to be realized, the greatest caution should be used in permitting the establishment of any obstacle to the flow of traffic.

From the record in this proceeding, it is apparent that a grade separation is physically feasible and can be constructed at a cost ranging between \$75,000 and \$115,000, depending on the type of structure used. The most feasible manner appears to be to carry the railroad track over the highway and depressing slightly the grade of the highway.

It is my opinion that this crossing should be constructed at separated grades in the above manner but the details as to the type of structure and the fixing of the grades should be worked out between the parties or, if the parties fail to agree, the Commission can then decide as to these details. In fixing the grade lines, attention should be given to the crossing of the spur with the proposed track of the Western Pacific California Railroad Company.

If the area proposed to be developed as an industrial area does reach the full development of which it is capable, the cost of a separation of grades will be very nominal when compared to the revenue derived from freight or the increased value it will give the land to be served. On the other hand, the moving factor in this grade separation is the greater convenience and safety for the automobile using public.

After carefully considering the record in this proceeding, it seems to me that the cost of constructing said separation should be equally divided between the Department of Public Works of the State of California and Southern Pacific Company.

The following form of order is accordingly recommended:

ORDER

The Commission having instituted an investigation on its own motion in the above entitled matter, hearings having been held and both the Department of Public Works of the State of California and Southern Pacific Company having submitted the matter to the Commission for determination as to the manner of constructing the crossing and apportionment of the cost:

It is hereby ordered, that if and when the Department of Public Works of the State of California and Southern Pacific Company, or either of them, desire to construct the crossing of a state highway and a spur track, in the vicinity of engineer's station 725, as shown on sheet 6 of Exhibit No. 1, entitled "Plan and Profile of Proposed State Highway in San Mateo County," filed in this proceeding, said crossing shall be constructed subject to the following conditions and not otherwise:

(1) Said crossing shall be constructed at separated grades and said separation of grades shall be effected by constructing the railroad track above the state highway.

(2) Said crossing shall be constructed with clearances conforming to the provisions of General Order No. 26-C.

(3) Before undertaking the construction of said crossing, a complete set of plans of the grade separation construction, together with profiles of the highway and the railroad, shall be submitted to the Commission, to be subject to its approval.

(4) The cost of effecting said separation of grades, including the approaches on the railroad and any excavation which may be necessary in connection with the change in grade of the highway, shall be borne 50 per cent by Southern Pacific Company and 50 per cent by the Department of Public Works of the State of California.

(5) Within sixty days from the date of this order,

U. S. SUPREME COURT OKES CALIFORNIA TAX LAWS ON GASOLINE-MOTOR VEHICLES

(Continued from page 11.)

cause is here by direct appeal; and the only matter for our determination is the validity of the challenged classification.

The power of a state in respect of classification has often been declared by opinions here. We are unable to say that there was no reasonable basis for the one under consideration; the court below reached the proper result; and its decree must be affirmed.

Appellants voluntarily assumed the position of common carriers operating between fixed termini and enjoy all consequent benefits. That a marked distinction exists between common and private carriers by auto vehicles appears from *Frost & F. Trucking Co. vs. Railroad Commission*, 271 U. S. 583, 70 L. Ed. 1101, 47 A. L. R. 457, 46 Sup. Ct. Rep. 605, and *Michigan Pub. Utilities Commission vs. Duke*, 266 U. S. 570, 69 L. Ed. 445, 36 A. L. R. 1105, 45 Sup. Ct. Rep. 191. Sufficient reasons for placing common carriers, operating as appellants do, in a special class, are pointed out by *Raymond vs. Holm*, 165 Minn. 215, 206 N. W. 166 (Dec. 4, 1925); *State vs. Le Fevere*, 174 Minn. 248, 219 N. W. 167 (April 13, 1928); *Iowa Motor Vehicle Assn. vs. Railroad Comrs.—Iowa*, —, 221 N. W. 364 (Sept. 28, 1928); *Liberty Highway Co. vs. Michigan Pub. Utilities Commission* (D. C.) 294 Fed. 703. Their use of the highways probably will be regular and frequent and, therefore, unusually destructive thereto. Also it will expose the public to dangers exceeding those consequent upon the occasional movements of other carriers.

Although relied upon by counsel, and said to be almost identical with the case at bar, *Quaker City Cab Co. vs. Pennsylvania*, 277 U. S. 389, 72 L. Ed. 927, 48 Sup. Ct. Rep. 553, gives no support to claim of undue discrimination. We regard the controversy as not open to serious doubt, and further discussion of it seems unnecessary.

said Southern Pacific Company shall notify this Commission as to whether or not it intends to construct said crossing.

(6) If said separation is effected, Southern Pacific Company shall, within thirty days after the construction thereof notify this Commission, in writing, of the completion of this work.

(7) If said crossing shall not have been installed within two years from the date of this order the authorization herein granted shall then lapse and become void unless further time is granted by subsequent order.

(8) The Commission reserves the right to make such further orders relative to the location, construction, operation, maintenance and protection of said crossing, as to it may seem right and proper and to revoke its permission if, in its judgement, the public convenience and necessity demand such action.

The effective date of this order shall be twenty days from and after the date hereof.

The foregoing opinion and order are hereby approved and ordered filed as the opinion and order of the Railroad Commission of the State of California.

Dated at San Francisco, California, this seventh day of December, 1929.

THOS. S. LOUITT,
C. L. SEAVEY,
EZRA W. DEOTO,
LEON O. WHITSELL,
W. J. CARR,
Commissioners.

New Highway Along Clear Lake



View on new highway bordering Clear Lake.

THE new section of state highway between Clear Lake Oaks and Lucerne was thrown open to travel on December 14, 1929. An elaborate program had been prepared to celebrate the opening of the road, but heavy storms forced its curtailment. Despite the rain, however, the occasion was duly feted at a banquet held at Lucerne. Robert Austin of the Redwood Empire Association presided as toastmaster, and felicitatory messages were received from many distinguished citizens, including a message of congratulations from Governor C. C. Young.

While the contract had not been entirely completed when thrown open to travel, grading and surfacing was practically completed. The section is a part of the Tahoe-Ukiah Highway.

The length of the section is 10.6 miles, and its cost is approximately \$285,000. The contractors are von der Hellen, Pierson and Logan of Medford, Oregon.

It has required one year to complete this construction, the contractor having started his work December 11, 1928. The highway as completed is graded 24 feet wide and surfaced with untreated crushed gravel 20 feet wide by 6 inches thick, which will be oil-treated during the coming summer. The material for surfacing was obtained locally.

Approximately 225,000 cubic yards of roadway excavation was required in this construction.

W. G. Tinney was resident engineer in charge of the work for the state.

This portion is the first unit of the Tahoe-Ukiah road completed between Ukiah and Williams.

The completion of this unit, together with other projects under way, will make the country in the vicinity of Clear Lake easily reached by highway transportation, the value of which is reflected in the desirability for existing and proposed residences and resorts along the lake.

The State Highway Patrolman

By B. B. MEEK, Director, State Department of Public Works.*

THE purpose of highways is to serve travel.

This being so, the safety, the convenience and the comfort of traffic must ever be uppermost in the minds of highway builders. The highway must be planned to make its use safe. It must be designed to make travel economical. And with these factors of safety and economy, there must always be included the additional factors of comfort and enjoyment in highway use.

But with all the care, the thought and the money road engineers and road builders can put into the highway, their entire effort will fail, if travel using the road is careless and reckless in such use.

The careless motorist can make the safest highway dangerous.

In a moment's time a reckless motorist can undo all the months of effort and time and can bring to naught the millions of dollars that have been expended in the attempt to make our highways safe.

Proper regulation and control of traffic are accordingly as essential to a GOOD highway system as are proper plans for its building and the use of proper materials in its construction.

Engineers and builders are the men behind the line in the battle for good roads. Maintenance forces and traffic officers are the men on the firing line. The maintenance engineers must see that roads once built are maintained in adequate condition for travel. Traffic officers must see that travel uses these roads properly.

This latter task is by no means a small one. I had occasion recently to summarize the job somewhat as follows:

California law permits a driver of an automobile to travel, under favorable conditions, at a rate of 58½ feet a second. The automobile manufacturers and distributors have seen to it that a large portion

of the machines on the highway are capable of traveling easily at the rate of 75 or even 90 feet a second. The hand and eye and mind of man can be coordinated by education to a marvelous degree but a 3000-pound automobile, traveling at a lawful speed of nearly 60 feet a second, or 40 miles an hour, is a force to be reckoned with at any time.

Multiply this by the hundreds of thousands of cars traveling our highways, each operating on its own schedule, coming and going, backing into and crossing traffic, as desire or necessity may dictate, and you have something of the picture of the problem that confronts the men who build and maintain highways, and those who seek to control their operation.

The problem of controlling traffic, however, is by no means, unsolvable. An assisting force in the fight for better highways is the fact that an overwhelming majority of motorists desire to be careful and to do the right

and fair thing by fellow motorists. The problem these drivers present is to bring to them a realization of the great, everpresent and immediate danger that lurks behind the least act in careless driving. The traffic officer becomes here a professor in the College of Safe Driving, the students of which extend over the world and are literally numbered by

THE TRAFFIC OFFICER A "COP" NO LONGER

The successful traffic officer accordingly must possess a rare combination of qualities.

He must be patient, even where impatience would seemingly be justified; he must be courteous, even to those who may not be courteous to him. He must be kindly without sacrifice of firmness. He must be both a teacher and an officer, his attitude instructive toward those who desire to be instructed, and his control courteous but immediate and certain, toward those who refuse instruction.

the millions.

Unfortunately there is a very small minority of motorists who either are congenitally reckless or who for some reason known only to themselves refuse to be careful. This class of drivers must be controlled with both firmness and sternness. Every moment that they are on the road, they constitute a menace to the life of other travelers. In this class belongs the drunken driver. Toward these drivers the attitude of the traffic officer must be that of a policeman, exercising his duties without fear and without favor.

The successful traffic officer accordingly must possess a rare combination of qualities.

He must be patient, even where impatience would seemingly be justified; he must be courteous, even to those who may not be

* Reprinted from the 1929 convention yearbook of the State Highway Patrolmen.

courteous to him. He must be kindly without sacrifice of firmness. He must be both a teacher and an officer, his attitude instructive toward those who desire to be instructed, and his control, courteous but immediate and certain, toward those who refuse instruction.

It may be an idle dream, but I have been hoping, since I knew the Division of Motor Vehicles was to become a part of the Department of Public Works, that we may be able to change both the attitude of some, not all, traffic officers toward the motoring public, and the attitude of the motoring public toward traffic officers.

It seems to me that the chief function of the traffic officer should be to expedite the movement of traffic with safety; that arrests should be made only as a last resort to accomplish this; that the "gas station" traffic officer and the one who lurks behind a tree to pounce out upon the unwary motorist will have to go; that the traffic officer should be a friend of the motorist aiding him in distress and assisting in making his travel safe and pleasant.

To accomplish this would mean that a traffic officer would patrol the highways, always in sight, and distinguishable to the traveling public by the color of his car and uniform. Color of car and uniform, however, will not of themselves accomplish the transformation. The attitude of some of our officers, although I am happy to say, not all of them, toward the motorist would have to change.

I have also hoped that we may be able to change the attitude of the motorist toward the traffic officer.

My observation has been that some men, who are normally courteous and considerate, lose every sense of obligation toward their fellow men when they get behind the steering wheel of an automobile. Happily again this does not apply to all drivers, but rather to a small minority. Their attitude seems to be that they are not only the sworn enemies of the traffic officer but also that they owe no obligation to show consideration for the other fellow's rights and the other fellow's welfare. I have sometimes thought that we should amend the slogan "safety first" to read **SAFETY FIRST For the Other Fellow**. It seems to me that a great many things come before safety first for ourselves. Honor should come first, and consideration for the safety and the wellbeing of the other fellow. Then safety for all would follow. A motorist should not feel angry when stopped by a traffic officer. He should feel ashamed. Let me suggest that if motorists would force themselves, just for

one day, to be courteous and considerate to fellow motorists, they would get so many thrills in that one day that they would never return to the old practices and the old ways.

If the motorist and traffic officer would both play on the same side, the old game which has existed so long between the two would no longer have any zest.

I have the utmost confidence that the California Highway Patrol will come to be known the world over for the possession of those qualities and the exercise of those duties I have attempted to outline in the foregoing paragraphs. I believe that there will be added to the reputation that California highways now enjoys for comfort and beauty, the further encomium that they are the safest in the world, and credit for this will belong to the California Highway Patrol.

MAKING THE PRISONS SAFE AT NIGHT

(Continued from page 8.)

dors of ample width for safe and quick access, and all floors have the necessary baths, toilets, storage spaces and accessories.

The exterior of the structure is designed in a modernistic style of concrete construction and has a military appearance.

The completion of this unit comprising the cell block, hospital and administration quarters will represent an expenditure of \$313,000 including furnishings and equipment.

The State of California in addition has also prepared to care for the expansion in our prison population by appropriations from the legislature of 1929 for a prison for first offenders and a new women's prison. These institutions will be entirely new ones and when proper sites have been selected and approved the Division of Architecture will be called upon to study and plan buildings and auxiliaries to cope with the exceptional housing problems.

With the exception of a superintendent of construction and a foreman to lead in the various trades involved, all labor on these new buildings is performed by the prisoners. We are sometimes asked if we do not have difficulty in handling the convicts during construction. The answer is "not very often," for insolence and disobedience will not be tolerated and such cases are referred at once to the proper prison authorities. If the offense is repeated the prisoner goes into the "hole," which means solitary confinement.

No Loafing For
Gasoline Cash



Detour Praised by
Tracy Motorist



Convict Camps Keep
Meal Costs Down

Clippings, Letters and Comment



Dealing With State Highways

Redwood Empire
Praises Highways



Federal Aid Roads
Further Improved



Mountain Roads in
North Kept Open
Despite Storms

No Loafing For Gasoline Cash.

The speed with which the administration program is progressing to give employment to labor and to give roads to communities is revealed by the balances in state highway funds.

On November 30th cash balances in these funds were at their lowest point since April, 1927, which was before the one-cent gasoline tax became effective through the signature of Governor Young. The balances in the various highway funds on that date totaled \$3,656,917.52.

On the same date there were construction and improvement work orders outstanding amounting to \$10,668,427.15, practically all of which were contracts, and which exceeds the cash available by \$7,011,509.63. Total work order obligations including maintenance and preliminary surveys and plans, right of way and construction engineering totaled \$16,716,166.30, or \$13,059,248.78 in excess of cash available.

Therefore, even after the apportionment of gas tax revenue early in December amounting to \$11,710,898, there were work orders outstanding in excess of cash by \$1,348,350.78.

This policy of putting every dollar at work on the roads as fast as its receipt is assured will be continued.

* * * * *

Detour Maintenance Wins Praise.

The following letter speaks for itself:

Tracy, California,
December 11, 1929.

California Highway Commission,
Sacramento, California.
Dear Sirs:

Re: The highway between Tracy and Mossdale.

I think that the Highway Commission and also the contractor, Clyde W. Wood should be commended for

the speed with which this project has been completed and for the fine job that has been done.

The detour which was in use during construction was kept in the best condition of any detour over which I have ever traveled.

I am just sending this little word of praise because I know that probably words of criticism are more often received, and that you might enjoy some show of appreciation.

Very truly yours,

J. F. DOUGHTY, M.D.

* * * * *

Sounds Incredible But It's True.

Attached is a menu of one of the highway convict camps which has consistently kept its costs from 25 to 27 cents per meal:

BREAKFAST

Eggs, Fried
Hot Cakes and Syrup
Mush, Hominy, Gritz
Apple Sauce
Bread and Butter
Coffee and Milk and Sugar

LUNCH (In Camp)

Roast Rib Beef and Brown Gravy
Baked Potatoes—Beans
Asparagus
Lettuce Salad
Bread and Butter—Pie (Pineapple)
Coffee, Milk and Sugar

LUNCH (Sandwiches for Grade)

Bread and Butter With Pork Sausage, Frankfurters
and pickle filling
Cake and Fruit (Oranges)
Coffee, Milk and Sugar—Taken out while hot by truck

DINNER

Beef Stew and Rice
Lettuce Salad
String Beans
Potatoes (Boiled)
Coffee, Tea, Milk and Sugar
Bread and Butter
Doughnuts

Another Sign of Progress.

We quote in part from a letter received on December 3d by the California Highway Commission:

"Would you grant me a permit to build a new kind of college, hotel, airship port, automobile service station and hot dog stand on the state highway?"

Cornell Magazine Tells of California Highways.

W. F. Faustman, Assistant Engineer in the Division of Highways contributed the feature article to a recent issue of *The Cornell Engineer*. Mr. Faustman's article was entitled "Recent Progress in construction of California State Highways."

Federal Aid Roads Further Improved.

The following dispatch from Washington tells of the year's progress on federal aid roads:

WASHINGTON, Nov. 30.—More than 7400 miles of the Federal Aid Highway System were initially improved by the forty-eight states and Hawaii in cooperation with the National Government during the fiscal year 1929. Thomas E. Macdonald, Chief of the Bureau of Public Roads, announced in his annual report today. Initially improved highways are those upon which no federal aid funds have previously been expended.

Advanced stages of improvement, involving the surfacing of roads previously graded and drained, were completed on 1988 miles of the system. At the close of the fiscal year initial improvements were in progress on about 8358 miles and advanced stage construction was under way on 1167 miles. On that date the actual length of improved roads was 78,096 miles, or about 41 per cent of the total of 188,857 miles in the system.

The cost of the year's improvement was \$195,298,168, of which the Federal Government paid \$82,736,878 or 42 per cent.

Resolution Commends State Highway Work.

The following resolution was unanimously adopted at the ninth annual convention of the Redwood Empire Association:

WHEREAS, The California Highway Commission and the State Department of Public Works have rendered accessible the Redwood Empire counties in safety, comfort, and with pleasure and convenience, by improving the Redwood Empire system of highways during the past year, and

WHEREAS, The Director of the State Department of Public Works, also members of the California Highway Commission, also engineers and attorneys and other officials of the Commission, have cooperated with the Nine Counties Highways Committee of the

Redwood Empire Association at all times in working out the schedule of budget allotments and highway improvements, and

WHEREAS, These highway improvements and budget allotments have made possible the greatest influx of tourist traffic ever had by the nine Redwood Empire counties, which has added to the wealth and prosperity of the Redwood Empire as a whole, as well as to the Redwood Empire communities individually; now, therefore, be it

Resolved, That the officers, directors and the entire constituency of the Redwood Empire Association, including boards of supervisors, the press, chambers of commerce and all interests in the nine counties, do hereby express their hearty appreciation and their thanks to the State Department of Public Works and the California Highway Commission, and

Be it further resolved, That copies of this resolution be transmitted to all interested parties, and to the press.

Mountain Roads in North Kept Open Despite Storms.

The exceedingly heavy rains occurring in the mountainous districts in northern California between December 8 and 17 caused considerable damage in the way of slides and minor washouts.

Rains which reached the volume of cloud bursts occurred in the Sacramento Canyon district and caused many small slides. Only one or two large slides occurred and while they threatened for a time to close the road to traffic, the prompt attention on the part of the maintenance crews kept the road open continuously for traffic.

In Lassen County cloud bursts caused high water which damaged the road to a considerable extent near Doyle. In the vicinity of Chester the Feather River was out of its banks on a short portion of the old county road which is still under state maintenance, making it necessary to detour traffic around the lower end of Lake Almanor for several hours.

Reports coming in from other sections in the same general area show that while the rain was exceedingly heavy, no serious damage resulted.

KENTUCKY—A total hard-surfaced construction program of 200 miles, costing \$700,000, is outlined for counties in the western part of the state for 1930.

KANSAS—The Jayhawk state had a 1929 construction program with a total of 1875 miles, which included 800 miles of grading, 1000 miles "sand and gravel" and 75 miles hard surface.

MASSACHUSETTS—Under the direction of Jas. H. Taylor, highway landscape supervisor, the Department of Public Works is undertaking extensive and permanent beautification of the roadsides on state roads.

Salinity and
Barrier study

Investigation on
Many Streams
Now Under
Way

Review of December Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

State Dam
Supervision

Reclamation

Irrigation

Flood Control

WATER RESOURCES

Salinity Investigation

The regular 76 salinity observation stations that were maintained during the summer have been reduced to 30 of which 26 will be continued as all year 'round stations as agreed at the conference of the Advisory Engineering Committee held on September 24, 1929. The regular drainage water stations are to be maintained until further notice. Additional tidal cycle salinity measurements were taken at locations where the desired salinity content and tidal characteristics could be obtained. Due to deficiency of precipitation the river has not increased in flow to an extent that warranted additional tidal cycle stream flow measurements in the various channels. The maintenance of the tide gages has continued and will be maintained throughout the winter. Analytical studies of stream flow and tidal data on relation of salinity thereto have been continued. Statistics on the growth of storage developments on the Sacramento and San Joaquin rivers have been completed.

Salt Water Barrier

A program covering the investigation and study of the economic as well as the physical aspects of the Salt Water Barrier below the confluence of the Sacramento and San Joaquin rivers has been tentatively adopted. However, the final set-up of procedure will not be determined until it has been reviewed and adopted by the joint State-Federal Commission.

The tentative program is designed to include:

1. An investigation and study of other possible sites and types of structure.
2. A study of the relation of the proposed barrier at the several sites to industrial, irrigation and reclamation developments; domestic water supply; flood control; navigation; fish industry; and other items in order to determine the benefits or detriments that would accrue in each particular instance.
3. An analysis to determine the economic feasibility of the barrier in relation to the various elements enumerated above.

The entire plan of the investigation is prepared with a view of evaluating the benefits that would be derived from the barrier and determining whether they would be commensurate with its cost. Until these economic features are thoroughly analyzed the relative value of a salt water barrier located below the confluence of the Sacramento and San Joaquin rivers as a unit in the state-wide plan of water development remains undetermined.

Six men are now employed on this investigation, five men in the office and one in the field. The field work has consisted of the collection of data on reclamation and irrigation developments in the area tributary to Suisun and San Pablo bays.

Bulletin No. 17, Southern California

Preliminary draft of five chapters of Bulletin 17 has been prepared and submitted to the consulting board, which will meet on December 17th in Los Angeles for the purpose of reviewing the report. If these chapters receive the approval of the committee they will be forwarded to the print shop immediately. One chapter yet remains to be drafted and submitted to the consulting board.

Santa Ana Investigation

The work on measurement of percolation from rainfall on the valley floor, measuring of stream runoff, rising water and losses in the stream and the work on transpiration from seeped areas, cultivated areas and areas in native vegetation has continued. In addition to this work it appeared on further study of the legislative enactment of the legislature of 1929 that further investigations into the plan of conservation of the water of the Santa Ana River were authorized and it was decided to take up the matter of spreading on the Santa Ana cone and on the various cones westward thereof belonging to the small creeks discharging on to the Cucamonga plain. Only work of a preliminary nature has been done to date, but a survey party will be in the field shortly to take topography, and it may be necessary to do some aerial mapping on the smaller streams.

Mojave River Investigation

Aerial survey of the entire area involved has been completed. Gaging stations on the two upper forks and at the lower site have also been completed. A map is being prepared of the valley.

Santa Maria River

Stations have been established on Sisquoc River, Cuyama River above the mouth of Huasna Creek and on Huasna Creek. The matter of a more general investigation into the ground water conditions in the valley has been further investigated and a program involving the expenditure of \$2,000 a year in addition to the maintenance of the above stream gages has tentatively been laid down.

Salinas River

Stations have been established on San Antonio Creek near the mouth and on Salinas River near the city of Salinas. The previous intention to place a gaging station on Nacimiento Creek was changed because it was difficult to get a station on that creek, and San Antonio Creek will, it is believed, give a similar unit run off, enabling an estimate of the water supplies from the west side to be made from the records as well as such an estimate could be made from the Nacimiento Creek records.

Santa Margarita Creek

Maintenance of the stations at Nigger Canyon and Temecula Canyon have been taken over as a part of the water resources investigation.

San Luis Rey River

Gaging station has been established at Bonsall and an additional one near Oceanside.

Gaging Stations in San Diego County

Discussions have been had with Mr. H. M. Savage, hydraulic engineer, city of San Diego, and it was agreed that the state would contribute \$75 per month toward the maintenance of stations at or near the international boundary on Campo, Tecate and Cottonwood creeks if the remainder would be contributed by the city of San Diego. However, these stations have not been established because it is felt desirable to secure the approval of the Mexican authorities on any sites for gaging stations which may be selected.

Whitewater River

A station was established on Palm Canyon Creek. In addition to this station, stations have been established on Whitewater River at the upper highway crossing and also below Indio. No attempt is to be made to meter the discharge of these two stations.

Kern River

The matter of gaging stations at Monache and on the North Fork near Whitney was taken up with the Federal Power Commission, but no decision has been reached by that organization to date.

Santa Clara Valley Investigation

November 5th the Santa Clara Valley Conservation District was approved by the voters and request was made to the state for a general hydrographic investigation of the entire Santa Clara Valley, of which San Jose is the principal city, by the State Division of Water Resources. The water plane in Santa Clara Valley has been dropping for many years past and the permanent ground water supply appears to be very much overdrawn by pumping. The program for conservation will consist in its first stages of spreading the runoff from the streams and causing it to sink underground, and probably at some future date in building reservoirs to iron out the peaks of the floods. The investigation desired is similar to those which the State Division of Water Resources has conducted in other coastal basins of the state. A tentative program for such an investigation was outlined, and as a part of the water resources investigation of the state it was agreed that one-half the cost of the investigation could be paid by the state under the appropriation of \$390,000 for water resources investigations made during the last legislature, if the district could advance the remaining half. This was agreed upon by the district and the investigation is being started.

San Joaquin Valley Investigation

About 20 miles of San Joaquin-Kings River Exchange Canal have been retraced and marked with pipes. Topography has been completed on about 6 miles.

About 60 miles of line have been located on the Kings River-Kern River Canal, cross sectioned, and special topography taken at stream and other crossings. The work during the last month has been particularly slow and tedious because of the location passing through the many orange groves in that vicinity. There remains about 5 miles of this type of work before the line emerges into the open country on the tule delta.

The U. S. E. D. survey of the San Joaquin River from Mossdale to Mendota has been completely checked and revised.

Tracing of the topography of the Mammoth Pool reservoir site proper has been completed.

Estimates of the water supply of the entire San Joaquin Basin have been prepared for the period 1889 to 1929 and averages for each stream basin and for the entire basin for the past 40, 20, 10 and 5 years have been made.

The Kings River investigation has been continued in close cooperation with representatives of the Federal Power Commission in San Francisco.

Sacramento Valley Investigation

The preliminary draft of report on Feather River has been completed. Water supply studies of streams in the Sacramento Basin have been continued during the present month. Classification of land and survey of crops have been made on 2,750,000 acres determined from field survey and on 537,000 acres based on data available in the office. Data have been gathered on actual use of water for irrigation and the probable use for certain crops from all available sources.

DAMS

The activities of this subdivision are being directed first to the prosecution of the current work before the office and second to the development of personnel and methods necessary to adequately handle the duties imposed upon the Department by the law providing for the supervision of dams. Considerable time is also being devoted to coordinating this work with other activities of the division in which much attention is being given to the rearrangement of the file system and the establishment of a direct and adequate method of interoffice exchange of data.

During the present month applications have been received for one new dam, namely, the Hansen Dam of the Los Angeles County Flood Control District, and for the revision of two dams, Lake Hodges and Black Rock. Sixteen applications have been received requesting approval of existing dams and two for revisions and alterations of dams already built. The total amount of fees received for the inspection of dams to December 14, 1929, amounts to \$47,062.26.

A total of 32 field inspections of dams has been made since submission of our last report, and certificates of approval have been issued for four dams, namely, Lake Hodges, Lake Almanor, Shaver Lake and Bear Gulch. During the present month a check of the plans and spillway capacities of Sunset Canyon and Hansen dams of the Los Angeles County Flood Control District has been made.

The consulting board retained to investigate and report upon the San Gabriel Dam has made an investigation of the Mulholland Dam of the city of Los Angeles, and is now preparing a report upon its findings. There has been considerable comment as to the safety of this structure, and it was therefore deemed advisable to have this same board make an investigation of this dam.

An analysis of the stresses in this dam has also been made by the Division of Water Resources.

RECLAMATION AND FLOOD CONTROL*Maintenance of Sacramento and San Joaquin Drainage District*

The project maintenance work on the Sutter By-pass system in Sutter County has, during the past period, been confined largely to routine maintenance

work, including the clearing of timber growth in the various flood channels. Arrangements have been made to operate a dragline excavator on a rental basis for cleaning out the Wadsworth Canal, the collecting canals and various intercepting canals.

Cooperative bank protection work is now under way on the jobs mentioned in the last report: Reclamation Districts Nos. 535, 673, 730 and 900; Robinson Bend on the Feather River; and Feather River at Nicolaus Bridge.

Emergency Flood Control and Rectification of Rivers.

The protection work at Lower Tyler Island for Tyler Island Farms and Libby McNeill and Libby has been completed.

Tentative arrangements for protection work in Reclamation District No. 317 on the San Joaquin River have been made; cost approximately \$8,000.

Sacramento Flood Control Project

Satisfactory progress has been made in the clearing work in Sutter and Butte Slough by-passes. A total of 170 men have been employed at four different places, and a contract for clearing 100 acres has been half completed. It has been necessary to discontinue most of this clearing work in the last few days on account of rain and flood water, but it will be resumed as soon as the weather permits. Two camps are in operation.

Contracts have been awarded for clearing in the Feather River channel above Oroville, as follows:

(1) To August Dentener of Marysville, 56 acres, \$2,777.

(2) To L. J. Fallon and A. Frandrup of Marysville, 26 acres, \$1,664.

(3) To C. F. Rednall of Marysville, 34 acres, \$2,606.

(4) To Robert Gisler of Marysville, 50 acres, \$3,200.

(5) To J. E. Ely and W. D. Zervales of Oroville, 70 acres, \$4,480.

Work on these contracts commenced about December 1, but was discontinued on the 12th on account of flood water.

Reports have been prepared on a number of applications before the Reclamation Board, a number of orders respecting applications have been written, and rights of way for the West Intercepting Canal have been secured, in which two condemnation suits have been filed.

Russian River Jetty

The work on the jetty is now confined to placing quarry rock, which involves the operation of the quarry and railroad. Approximately 100 tons per day are being placed with a crew of 14 men. This work will be carried on in this manner without change for a considerable time.

Pajaro River Flood Control

The work of clearing the channel of the Pajaro River is complete, having been finished on December 7, at a total cost of \$3,600. The local people are pleased with the work done.

Mokelumne River Improvement

Work has been continued in the channel of the Mokelumne River in collaboration with San Joaquin County and is approximately 80 per cent complete. The recent rains have hindered the work considerably.

Flood Measurements and Gages

Preparations are complete to send out stream metering parties if this work becomes necessary, and all water stage gages are in operation.

IRRIGATION, WATER STORAGE DISTRICTS

During the month the financial and economic investigations made of the Naglee-Burk, Palmdale and Little Rock Creek Irrigation districts have been completed and reports prepared thereon. Further investigations have been made during the present month as to the feasibility of dissolving the following inactive irrigation districts of the state, namely, Dry Creek, South Capay, Baker, Feather River and Fullerton.

Investigation is being made of the water supply and susceptibility of the lands to irrigation in the proposed Dixon irrigation district located in Solano County, the sufficiency of its petition being approved by the County Board of Supervisors and filed with the State Engineer for investigation and report of feasibility.

Conferences have been held with the proponents of the proposed Feather, Richvale and Dixon irrigation districts and advice given them in connection with the projects proposed. Also, considerable time has been spent in assembling data relative to the financial status of various districts in the state, and a study of their ability to meet their obligations is being made.

The California Bond Certification Commission has under consideration the matter of the approval of the sale of the \$108,000 of bonds by the Nevada Irrigation District for construction purposes of the district from the second division of the second issue of bonds of this district.

WATER RIGHTS

Applications

During the month of November, 32 applications were received, 20 were rejected and 30 approved. 13 permits were revoked, 9 licenses issued and one license revoked.

Snow Surveys

The work on the snow survey investigation has consisted chiefly in completing the arrangements necessary in each basin for stocking shelter cabins and caching equipment in readiness for making the surveys, some of which will begin about January 1. Arrangements are practically complete for making the surveys in each major watershed of the Sierras.

DECEMBER REPORT OF DIVISION OF ARCHITECTURE

GEORGE E. MACDOUGALL, Chief

Contracts awarded from November 21st to December 16th total \$346,076. This includes contracts for general and mechanical work for the two barracks buildings at the Veterans' Home, totaling \$327,606, and minor projects at the Norwalk State Hospital and the Industrial Home for the Adult Blind.

During this same period bids were received upon which awards are pending for projects totaling \$20,900.

Projects now out for bids include the training school and power house at the San Diego State Teachers College and wrecking Strauss Hall at the California School for the Deaf.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

STATE PASSES 2,000,000 MOTOR VEHICLE MARK

California for the first time has passed the two million mark in the registration of motor vehicles. The total vehicles registered as of November 30, 1929, numbered 2,015,418, an increase of 184,813 or slightly more than 10 per cent over the same period in 1928.

Beginning with March, 1909, when the first \$18,000,000 bond issue was proposed in the state legislature for a state highway system, the registration totals for motor vehicles in California has increased as follows:

1909 (March)-----	10,600
1914 -----	123,516
1919 -----	477,450
1924 -----	1,350,752
1929 -----	2,015,418

STATE PRESSING NEW YORK

A comparison with New York registrations shows that California is pressing that state hard for leadership in the nation in motor vehicle registrations.

The New York figures as of December 1, 1929, are as follows:

Total registration of New York-----	2,293,565
Passenger cars of New York-----	1,872,677
Passenger cars of California-----	1,872,099

New York accordingly has 578 more passenger cars than California.

California leads, however, in the per capita ownership of automobiles with 2.87 persons per automobile as compared with 6.56 persons per automobile—New York.

1930 PLATES

All counters were opened Monday, December 16th, for issuance of 1930 license plates.

Mail applications were invited effective December 1st, but the response has been small, approximately 25,000 having been received up to December 16th. Certificates for those received by mail were practically all typed and were ready for mailing, but were held until after Christmas at the request of the United States Postal authorities.

License plates and necessary supplies sufficient for the 1930 renewal were on hand at all distribution points.

Certification for anticipated extra employees for renewal period at all branch offices was requested through and furnished by the Civil Service Commission, and as the extra help is needed, they were called from such list.

"Miranda, whassat light shinin' in yo' eyes?"
"Tha's my stop light, Rastus."

REGISTRATION FOR DRIVERS

The Division of Motor Vehicles has registered 2,550,956 applicants, who have passed an examination as required by law to drive motor vehicles. This huge task was made possible by the splendid assistance and cooperation given this department by 500 outside agencies, comprised of chiefs of police, county sheriffs, constables, judges and operator examiners employed by the Division of Motor Vehicles.

Without the cooperation of the various chiefs of police and law enforcing agencies throughout the state, and without their aid, a solution of the problem provided by law could have only been accomplished by training a force of 500 operator examiners throughout the state at an annual cost of \$1,050,000. At no time during the peak of the examination did the state exceed 59 paid operator examiners and at the present time is carrying on this work with 26 men.

CALIFORNIA HIGHWAY PATROL

The organization of the California Highway Patrol is progressing as fast as possible. The Purchasing Department has asked for and received bids on the necessary automobiles and motorcycles and as soon as the purchases are completed, motor equipment will be assigned to each officer of the patrol.

STOP, LOOK AND LISTEN

The one sure remedy for grade crossing and highway automobile accidents is safe driving. Accidents generally result from carelessness or incompetence. Instead of burdening the people with compulsory insurance, legislation and tax issues to eliminate all grade crossings, educate the public and enforce practical traffic codes. Reckless and drunken drivers should not be allowed on highways. They are a constant menace to life and property. Those who dash across grade crossings and give no heed to traffic regulations should, after warning be deprived of licenses. The railroads of the country, in their great work to reduce accidents, have succeeded in every phase of the problem but grade crossing collisions. It takes an average of seven seconds for a train to pass any given spot. Yet every year thousands of people, unwilling to wait the seven seconds, lose their lives. Accident reduction is mainly a matter of teaching drivers when to step on the brake instead of the accelerator.—*Pillager Herald*.

Professor: "Take the sentence, 'The Indian sneaked silently into the wigwams.' What tense?"

Mimi: "His sweetie's, I suppose."

Young lady motorist—"It's snowing and sleeting and I'd like to buy some chains for my tires."

"I'm sorry—we keep only groceries."

"How annoying! I understood this was a chain store."—*Judge*.

The efficiency expert is worse than the statistician but he belongs to the same breed. He will tell you that if a farmer's boy can pick six quarts of cherries in an hour, and a girl five quarts, the two of them together will pick eleven quarts. But any farmer knows that the two of them together will not pick any.

Cross-Section of Highway Thought On Problems Affecting All States

A CROSS-SECTION of the view of state highway officials on state highway policies and problems of common interest to all the states was contained in resolutions adopted by the American Association of State Highway Officials at their annual convention in San Antonio, Texas.

California was represented at the convention by C. H. Purcell, State Highway Engineer, and a member of the Executive Committee of the association.

The resolutions adopted by the convention, and which appear in full in the January issue of *American Highways*, covers the following subjects:

FEDERAL AID

Because—

The rate of progress in construction of federal aid highways is not keeping pace with the increase in motor vehicle traffic; and the several states of the Union, in answer to urgent public demands, have to date built more miles of the Federal Aid Highway System without Federal Aid than with it; and during the past year less than 10 per cent of the funds used in construction of state trunk line highways was contributed by the federal government.

It is urged that —

Congress increase the Federal Aid Highway Appropriation to \$125,000,000 for each of the fiscal years 1932 and 1933 and that the present appropriation for the fiscal year 1931 be increased from \$75,000,000 to at least \$100,000,000.

Because—

The Federal Aid System, approved by the Federal Government in 1921, and which connects all the county seats and main market centers of the country, is still less than 50 per cent even gravel surfaced.

It is declared that—

It would be unwise at this time to appropriate funds for any further mileage and that this Association recommend that the federal funds be concentrated on the present federal aid system.

Because—

The present limitation of \$15,000 per mile placed on federal aid participation in highway construction is burdensome to many of the states, in that it has no relation to the actual cost of construction; and because the construction of important gaps in the Federal Highway System are frequently delayed due to this limitation.

It is recommended that—

Congress reserve the limitation of \$15,000 per mile and that the Secretary of Agriculture be authorized to fix a base of participation in all cases with the sole limitation that Federal Aid should not exceed 50 per cent of the cost.

FOREST HIGHWAYS

Because—

The progress being made in the construction of the United States Forest Highway System is lagging behind that being accomplished on other portions of the Federal Highway System in such states; and the improvement of the said United States Forest Highway System is essential from the standpoint of providing continuous important transcontinental highways at the earliest possible date, which would not otherwise be provided until many years after the completion of the balance of the Federal Highway System.

It was voted that—

A bill now pending in Congress be endorsed. This bill increases the authorization for Forest Highways for 1931 to \$10,000,000. The proposed legislation increasing the authorizations for 1932 and 1933 to \$12,500,000 per year, was also endorsed, said increase to be applied on those Forest Highways located on the Federal Highway System until such systems in the several states have been completed.

HIGHWAYS OVER PUBLIC DOMAIN

Because—

The desirability of expediting the construction of interstate highways across the public domain and the progress now being made indicates the urgent necessity for increased federal appropriations for the construction of important connecting links on interstate highways across the forest reservations, unreserved public lands, nontaxable Indian lands, and other federal reservations; and without a large increase of public funds for this purpose it will be impossible for many years to complete transcontinental highway systems; and as the federal government controls a very large percentage of the total area of the 11 western public land states and for that reason should rightfully accept the burden of ownership at least to the extent of building and maintaining roads across its lands.

It was decided that—

The Association of State Highway Officials should go on record in favor of the enactment of bills now pending in the Congress of the United States, S. 121 by Senator Oddie, and a companion measure, H. R. 1416, by Representative Colton, which bills are

designed to lay the foundation for larger appropriations for the purpose indicated herein.

GRADE CROSSINGS

Because—

Progress in the elimination of crossings at grade between highways and railways, one of the major hazards to traffic, is largely dependent upon equitable division of costs between the railroad companies and the state highway departments.

It is asked that—

All of the states should enact statutes requiring the railroads to participate in the cost of grade separation structures and in line with well established precedent, the share of the railroad companies in the total cost of such grade separations, including all necessary approaches and drainage structures, should not be less than 50 per cent; and that all wigwag or flashing signals be installed on the right side of the highway approaching the grade crossing, and that center installation of such signals be used only when side installation is utterly impracticable.

ROADSIDE BEAUTIFICATION

Because—

There is a growing realization of the fact that in the best highway development there is found, in addition to construction and maintenance, a recognition of the aesthetic values present on or near every highway and that it is a proper function of the state highway departments to engage in highway beautification and in the preservation and development of natural and scenic attractions and aesthetic values made available by the highways; and as the construction of highways through natural scenic areas often spoils the doom of the natural beauty and attractiveness of the area by making it accessible for commercialization and denudation and realizing that certain highways are thereby robbed of the very features for which they were built; and as it appears practicable in many places to preserve roadside strips of natural country which may be held for the enjoyment of all the people; and as in many places the natural beauty of the countryside is made uninteresting or invisible by the presence of distracting advertising signs:

It was ordered that—

The Executive Committee of the association appoint a Committee on Roadside Beautification to deal with problems and studies relating to roadside parks, strips of natural timber screen, roadside advertising, and beautification.

TOLL BRIDGES

Because—

Private financial interests are still undertaking to commercialize and exploit the traffic on the roads of the state and Federal Aid highway systems by the construction and operation of toll bridges at points where traffic is concentrated as a result of the vast expenditure of public funds on the construction of these free highways; and these interests, in order to further their own schemes have actively opposed con-

struction and financing bridge programs of properly constituted public authorities; and, in spite of the fact that Congress has, during the past year, in granting franchises to privately owned toll bridge companies, strengthened the situation by making additional requirements of these toll companies to protect the public, there are still a number of features not included in the franchise forms used by Congress, and since the general bridge law, which was passed March 23, 1906, is deficient and the Congress should reenact laws covering the entire toll bridge situation;

It is resolved that—

The American Association of State Highway Officials, is unalterably opposed to privately owned and controlled toll bridges upon state and Federal Aid systems of highways, but is not opposed to publicly constructed, owned and operated toll bridges where adequate public funds are not available for immediate construction of the free bridges needed to complete the interstate and intrastate highway systems as planned; and

That before any additional franchises are granted, the general bridge law should be changed so that the following requirements should also be included in all future franchises granted:

1. All franchises should be effective only on state approval as to location, design, plans, specifications, etc.
2. State supervision of construction.
3. Limitation of amount of securities.
4. Any appreciable change in bridge plans should be subject to approval by the state and should require re-advertising for bids.
5. State supervision of maintenance.

It was further resolved that the association recommend to the Committee on Interstate and Foreign Commerce of the Congress of the United States that it withhold its approval of any measure authorizing or consenting to the construction of a privately owned toll bridge on the state or Federal Aid highway systems unless after a thorough investigation the committee has determined that there is a lack of financial resources or intention of the proper political subdivisions to finance and construct a free or publicly owned toll bridge; and

That the association recommends that there be included in every congressional authorization or consent for the construction of privately owned toll bridges on the state or Federal Aid highway systems, a provision that the bridge, when completed, may be acquired by the public at any time by the payment of an amount not greater than its original cost less reasonable depreciation due to use and the cost of replacement of faulty construction and design.

MOTOR VEHICLE REGISTRATION

Because—

There is considerable variation in the practice of licensing motor vehicles in the several states, some states having an adequate fee which is in lieu of all other taxes, while others have a nominal fee supplemented by a personal property tax;

It is recommended that—

Such states as are issuing such licenses and license plates upon the payment of a nominal fee, that the applicant for a license be compelled to submit a tax receipt showing that all additional taxes contemplated by the laws of the states have been paid, before such licenses and license plates are issued.

HOW CALIFORNIA PREPARES FOR FLOODS

(Continued from page 2.)

not this amount will be found adequate and the division equitable through a period of years remains to be determined by experience.

Organization.

The duties of the Department of Public Works in respect to flood control and reclamation are delegated to the Division of Water Resources, which succeeds the old Division of Engineering and Irrigation. The activities of this division in connection with the maintenance of the flood control project were commenced in September, 1927, and have been carried on continuously since that time.

The routine of maintenance consists of keeping in repair and condition the various works, levees and channels under the direct care of the division, and is carried on during the entire year by an organization engaged exclusively on this work, which includes bank protection. During the flood season, this force patrols and inspects various levees and works, and is prepared to protect weak places as they appear and to make necessary repairs. Equipment, tools and supplies are kept available for immediate use in emergencies. Both the routine maintenance work and the special work which must be done each year during the flood involves work of many varieties, and the crew is so organized that it may be expanded rapidly, with the various gangs in charge of foremen experienced in the particular kind of work required to be done.

During the year the size of the maintenance force varies from about thirty to seventy men, except during emergency when the number may be considerably greater. The larger items of work in connection with the routine maintenance, particularly replacements and improvements, are usually done by contract, but the nature of the greater portion of the activities is such that it can best be performed directly by division forces. The bulk of the routine work is in connection with the Sutter-Butte By-pass Project No. 6 in Sutter County. This is in charge of a maintenance foreman with headquarters in Sutter City, which is also a central point for carrying on activities in the northern portion of the Sacramento Valley, extending from the vicinity of Marysville and Colusa north. All river bank protection work and work in the southern portion of the valley are done directly out of the Sacramento office of the division.

Routine Maintenance.

The levees are kept free of noxious weeds and burrowing animals and the roads on the levees are kept in repair. These roads are used to a considerable extent by the public, but during wet weather the levees are closed by gates so that the surface will not be cut by traffic, when the maintenance force only is permitted to pass along the levees. Willows have been planted along the east levee of the Sutter By-pass for a distance of eleven miles, to produce a growth which will protect the levee from wave wash. The by-pass channel at this place has a width of 4000 feet, and the levee is exposed to a strong wave action during heavy south and southwest winds. These willows are planted in five rows five feet apart at the base of the levee, and it is necessary to irrigate them in the same manner that an orchard is irrigated. It is expected that an effective growth will be produced along a greater portion of this length within a period of three years. At the present time, all of the project levees are in good condition and there are no known weak points.

Pumping plants are maintained and operated to care for the intercepted drainage east of the Sutter By-pass. There are three of these plants, with a total of nine pumps and electric motors of 1500 total horsepower. Drainage water is conducted to these plants through 46 miles of canals of various sizes. These canals are kept clean and the canal structures, which are mostly bridges, are kept in repair.

In the by-passes there are numerous structures requiring maintenance, including bridges, weirs, bulkheads, jetties and current controlling structures. These are mostly of timber and require continuous repair. Some of them have been built for a number of years and replacements are necessary from time to time, which is done as maintenance.

A telephone system consisting of 30 miles of line and 12 telephones connects various parts of the project in Sutter County with the headquarters at Sutter City.

By-pass Clearing.

One of the most serious and vexatious problems in connection with maintenance is that of keeping the by-passes and overflow flood channels clear of timber growth. No feasible and economical method has yet been devised to accomplish this, aside from cutting by hand labor. It is estimated that the area in the by-passes and the overflow channels on which there is a tendency for timber to grow exceeds

6000 acres, much of which has never been cleared.

The clearing of land which has once been cleared is a maintenance operation and approximately \$20,000 per year is spent on this work. It is hoped that eventually those areas in the by-pass which are suitable for cultivation will be put into crop of some sort to eliminate the cost of clearing each year.

Through a state appropriation for new flood control project construction, there has been made available to this office the sum of \$65,000 for clearing land in the Sutter, Butte Slough and Tisdale By-pass, and the sum of \$27,500 for clearing along the Feather River overflow channel. Up to the time it was necessary to discontinue work on account of flood waters, on December 13, three crews were engaged on clearing with a total of 180 men. These were in charge of our own foremen, and were mostly local people. The opportunity for employment on this work was of very great benefit to the citizens in Sutter County. One contractor is also operating a camp in Sutter By-pass with a force of 50 men. This division maintained two camps of 60 men each, and it is proposed to reopen these camps and continue the clearing work as soon as the weather permits.

The clearing work along the Feather River is all being done under contract, at an average price of \$60 per acre. Six contracts have been let covering 60 per cent of the total work to be done, and were all under way during the recent December storm, when work was temporarily discontinued.

It is difficult to picture the varied activities of this division in connection with flood control and reclamation without going into considerable detail. Bare mention can be made here of the numerous things now being done, and no attempt is made to cover the subject of the Sacramento Flood Control Project itself or new construction, in which there is an increasing activity. In this biennium the State of California is expending \$350,000 for new construction in a program involving a total expenditure of \$721,000, in which the Federal Government and local interests participate.

Flood Gagings and Measurements.

During the winter season this division operates 32 automatic water stage recorders in the flood channels and obtains readings from about 50 staff gages. Preparations are complete and the necessary equipment is assembled to send 12 parties of engineers into the field during flood at a few hours notice to measure the quantity of water flowing at

certain strategic points in the flood channels. At certain places rating curves are being established and measurements are taken at various times during the winter. Each season the results of these observations and measurements are compiled in a mimeographed report, making the data available to all who are interested. These data are of particular value in engineering studies relating to flood control, and are obtained primarily for this purpose.

Careful watch is kept on flood stages to give out warnings, to determine when measurements are to be taken, and to guide in the operation of the Sacramento Weir. The weir is lighted and patrolled continuously during the time water is against the gates. The gates have not been opened since March, 1928, when all of the 48 gates were opened for the first time.

Bank Protection.

For a number of years in the past, the state has made appropriation of funds for the use of the State Engineer in rectifying river channels, protecting river banks and performing emergency flood work. Expenditure of this money was usually made in cooperation with other agencies. During the biennium ending June 30, 1929, this cooperation has been required, in which the state usually paid one-third of the total cost. This was known as the "river fund" and is discontinued in the present biennium. The corresponding work for the rivers in the Sacramento system is done out of the flood control maintenance appropriation, and the work in the other rivers of the state is cared for out of a small appropriation for "emergency flood protection and rectification of river channels in cooperation with other agencies."

The protection of banks of the river channels is an essential preparation against floods. The division has recently done, is doing or preparing to do, bank protection work on the Sacramento project in cooperation with other agencies, as follows:

Feather River at Robinson Bend, in cooperation with Butte County and landowners, slough closure	\$8,000
Feather River at Nicholas, in cooperation with Sutter County, seven tree and steel current retards	12,000
Feather River at Nelson Bend, in cooperation with Southern Pacific and California Debris Commission, bank replacement and protection	67,000
Sacramento River near Princeton, in cooperation with Levee District No. 3, repairs to current retards	3,000
Sacramento River near Knights Landing, in cooperation with Reclamation District No. 730, nine tree current retards.....	19,000

Sacramento River at Chicory Bend, in cooperation with Reclamation District No. 900, quarry rock protection-----	\$3,200
Sacramento River at Oak Hall Bend, in cooperation with Reclamation District No. 335, quarry rock-----	3,000
Sacramento River near Isleton, in cooperation with Division of Highways, piling toe wall with bank pavement-----	17,000
Georgiana Slough on Tyler Island, in cooperation with Tyler Island Farms and Libby, McNeill and Libby, timber bulkhead-----	3,000

Most of the above work, especially the construction of bulkheads and current retards, is done by contract, but the placing of quarry rock and the smaller work are done directly by the division. The division has in service a river fleet consisting of seven barges, including mess and sleeping quarters, derrick work barge and pile driver, and also several launches. This outfit is used for certain classes of bank protection work, is well equipped, and may be moved in emergency to any point on the Sacramento project on navigable water.

Outside of the Sacramento Valley.

While the division's maintenance of flood control works is confined to the Sacramento Valley, cooperative bank protection and river rectification work may be done on other streams wherever local interests require it. A small amount of this work has been done regularly in the past few years on the Mad River in Humboldt County, on Yager Creek in the same county, and on the San Joaquin River. Assistance may be rendered at any place during emergencies in flood time.

As provided in chapter 447, Statutes of 1929, the division is improving the channel of the Mokelumne River in collaboration with San Joaquin County. The river and part of the overflow channel are being cleared of timber growth, and numerous snags are being removed, at a cost of \$12,500. The work will be completed by January 8, by a force in charge of a foreman of the division. It is expected that an equal amount will be available to continue the work next year.

In cooperation with the counties of Santa Cruz and Monterey, the channel of the Pajaro River at Watsonville has been cleared of timber growth at a cost of \$4,000, by authority of chapter 524, Statutes of 1929. This was completed on December 23 by a crew in charge of a division foreman, and is a continuation of work undertaken last year, when \$7,500 was expended. A protective district is being organized to control the floods of the Pajaro River from which there is now no protection other than a clean, natural river channel.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MEEK-----Director
GEORGE C. MANSFIELD-----Editor

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Vol. 8 JANUARY, 1930 No. 1

PROBLEMS IN ROAD BUILDING THAT CALIFORNIA IS NOW INVESTIGATING

(Continued from page 6.)

- (e) Asphalt emulsion tests.
- (f) Asphalt extractor.
- (g) Investigation of methods of casting concrete test cylinders to secure uniform results.

(h) Alternate designs of reinforced concrete cribbing members.

Many old studies which were presumably completed are still under observation and are being supplemented from time to time by subsequent information.

The making of new tests and the carrying on of special investigations frequently involves the design and manufacture of new equipment for the purpose. Such equipment is designed and built in the Laboratory and Equipment Shop at Sacramento.

Several such items of equipment may be mentioned:

- (a) California type of field beam breaking machine.
- (b) Asphaltic concrete stability testing machine.
- (c) Strain gauge.
- (d) Equipment for measuring friction of expansion plates.
- (e) Sticky machine for measuring stickiness of asphaltic oils.

(f) Apparatus for determining soil compaction.

(g) Asphalt extractor (California design).

When studies are completed or the preliminary information secured is of such a nature that it is deemed of value, articles are prepared and published from time to time describing the work done and results secured.

Sub: "Can you name the three orders in architecture?"

General: "Sure! First mortgage, second mortgage, and foreclosure."

WEATHER CONDITIONS IN DECEMBER

By R. L. JONES.

DURING the month of December, 1929, the weather in general throughout the state was not abnormal in most respects in comparison with December weather in past years. The only feature at all unusual was the concentration of rainfall, into the single storm of the month and over that portion of the state north of San Francisco and Stockton. During the month of November and to December 9th, no rain fell at any point in the state.

On December 9th the storm commenced, centering its rainfall in the drainage basins of the Sacramento and Feather rivers, and continued until the 15th, with light rains only falling for the next few days. Some rain fell during this storm over most of the northern part of the state. The heaviest recorded precipitation in 24 hours was at Kennett on the upper Sacramento River on December 12th, when 10.79 inches fell, followed on the next day by 3.14 inches. The storm extended into the lower San Joaquin Valley with light rains only. A fall of 11 inches was reported from Buck's Valley on the Feather River on the 11th.

On the North Pacific coast fairly heavy rains fell, but not out of the ordinary. The maximum at Eureka was 1.35 inches on December 14th. The heaviest rain at Santa Rosa was 3.32 inches on December 10th. There was no rain at Bakersfield, Los Angeles nor San Diego. December storms in the past have usually been more general, with some rain in southern California, and also have usually been spread out more evenly throughout the month.

At the beginning of the new year the precipitation throughout the state was far below normal, and in the northern part, where the only considerable rain fell, it is not more than two-thirds of normal, in spite of the fact that in some parts the December storm precipitated rain in excess of the monthly normal. At Sacramento the seasonal rainfall to January 1st has been 4.21 inches as compared with a normal of 6.32 inches. There is practically no snow in the Sierra Nevada, while normally there should be at least 5 feet, hard packed.

No direct general comparison of the weather conditions in the December just past can be made readily with Decembers in previous

years, on account of the unusual distribution of rainfall, both as to time and locality.

At the beginning of the storm all the rivers in the Sacramento Valley were at extremely low stage, but none of them reached dangerous heights. The highest water was in the Sacramento and Feather rivers. The gage at Sacramento read 23.0 as against 26.5 in the March, 1928, storm. The water reached 14.0 on the Marysville gage, while it was at 24.0 in March, 1928.

Water passed down the Sutter By-pass and Tisdale By-pass and discharged over Fremont weir about 2 feet deep. The tidal reclamations in the lower Yolo By-pass were flooded, as was Prospect Island. There was no need to open the gates of the Sacramento weir for this storm.

Why shouldn't husbands be left at home while wives go vacationing? Somebody must consume the sardine catch.

Who remembers the old-fashioned hick who felt real wicked and devilish while watching the Bloomer Girls play baseball?

How the pastor talked to the highwaymen who sought the cash that he did not have: "Ah, gentlemen, I might, indeed, have something to give you if only I had such energetic fellows as you to pass the plate now and then."—*Christian Register*.

"Yassah," said old Link, "business very good. Done bought a pig fo' ten dollars, traded pig fo' a barrer, barrer fo' a calf, calf fo' a bicycle, and sol' de bicycle fo' ten dollars!"

"But yo' don' make nothin,' Link!"

"Sho' nough, but look at de business ah been doin'."—*Montreal Star*.

"Anatomically considered, laughter is the sensation of feeling good all over, and showing it principally in one spot. Morally considered, it is the next best thing to the Ten Commandments. Theoretically considered, it can out-argue all the logic in existence. Pyrotechnically considered, it is the fireworks of the soul. If a man can't laugh, there is some mistake made in putting him together, and if he won't laugh he wants as much keeping away from as a bear-trap when it is set."—Josh Billings.

An old colored woman who came to the Governor of Tennessee:

"Marse Govenah, I want my Sam pahdoned," said she.

"Where is he, auntie?"

"In de pententuary."

"What for?"

"Stealin' a ham."

"Did he steal it?"

"Yes, sah, he suah did."

"Is he a good nigger, auntie?"

"Lawdy, no, suh. He's a pow'ful wo'thless niggah."

"Then why do you want him pardoned?"

"'Cause, yo' honoh, we's plum out of ham ag'in."

Congress Urged to Enlarge Road Aid

THE FOLLOWING article is from the *United States Daily*.

There are two schools of thought in congress regarding increased appropriations for federal aid to the states for the federal aid highway system throughout the country. Representative Kelly (Rep.), of Pittsburgh, Pa., stated orally October 11. The major element in congress in all probability, he said, favor augmented highway facilities. The opposition is on the ground that the more prosperous states are carrying on the burden of the less prosperous. Mr. Kelly is a majority member of the House Committee on Post Offices and Post Roads.

"I believe the sentiment of the country and of congress favors expansion of highway facilities," Mr. Kelly said: "I am in favor of the announced program of the chairman of the House Committee on Roads, Representative Dowell, of Iowa, for \$145,000,000, instead of \$75,000,000, annually for federal aid for highways and for \$10,000,000 instead of \$7,500,000 annually for roads and trails in the forest reserves of the United States. I would favor going even further than that increase, if it should be felt to be necessary and the federal government and the states could properly and economically make use of such augmented funds each year.

OPPOSITION NOTED

"I realize that there is opposition from some in the east. They take the position that we are taking out of the income tax revenues of the east to help carry the road burdens of states that do not contribute to any great degree to the income tax revenues of the federal treasury.

"But I do not agree to any such contentions with respect to the federal aid highway system that is now a part of the great system of communication between the whole country. The United States today is a nation—not just a community of states.

"American citizens in all sections are entitled to the benefits of good roads. On a recent trip through Yellowstone National Park I saw hundreds of Pennsylvania and New York cars on the roads and they were all through that part of the country. The same is true in other sections. We are envisaging the federal aid system as a national program of import to the country as a whole.

"Good roads mean advantages to American citizens and to American business—no matter what their particular state may be. We should continue along the lines already established by increasing our national expenditures, along with the state expenditures, in order to keep pace with the steadily advancing tides of business.

ROADS IN FORESTS

"As a broad-visioned permanent national policy of gauging national expenditures according to the growing needs of the country as a whole I hope and believe that congress will carry out the roads committee program of \$145,000,000 for federal aid roads and \$10,000,000 for forest roads and trails annually hereafter. The former is a proposed increase of

\$70,000,000 over the present regular annual federal aid funds. The latter is an increase of \$2,500,000.

"And the increase of the forest road construction program is also important to the nation's economic welfare. Both funds are to meet national needs.

"Road construction is an important part of the country's activities everywhere. I recall that the head of the Federal Bureau of Roads, Thomas H. MacDonald, just back from an important international road meeting in South America, told our House Committee on Appropriations within the past year that the federal aid highway system then approximated 188,000 miles, that there was a total of upwards of \$5,000 or \$6,000 miles approved for federal aid. Then he estimated that, as of the same date, the states had improved about 70,000 miles without the aid of the federal cooperative funds.

"There are innumerable ways in which the facilitation of highway traffic wherever it may be is just as important to the great stream of interstate travel as to the immediate residents of a given city or commonwealth."

COOPERATION SOUGHT

The Chief of the Bureau of Public Roads, Thomas H. MacDonald, in his last statement of views before a congressional committee, told of the demand for cooperation in road building reaching his Bureau. "There is an insistent and growing demand for an increase in the federal support of the annual road-building program" he told the House Committee on Appropriations in urging the appropriation for the current fiscal year 1930. "For about eight years the country as a whole has been spending from \$1,000,000,000 to \$1,500,000,000 annually for highway purposes. This has been roughly equally divided between work done under state supervision and that done under local supervision. The federal aid road system coincides with the state roads to the extent of about two-thirds of the total mileage of the latter system. The federal aid projects have constituted about one-half of the states' annual program, and the federal contribution has been about 17 per cent of the total expenditures supervised by the states, or only about 8 per cent of the whole of the annual highway expenditures.

"The most generous contributors to the highway program by far have been the local units, particularly the counties. So we find now that in many states the counties have about exhausted their credit for aiding the building of the roads which legally are state, or state and national responsibilities, and there are no funds left to build the feeder roads."

PENNSYLVANIA—Contractors engaged in state road work were employing 8134 men, according to the last report compiled by the Department of Highways. An additional 8294 were employed in road maintenance by the department.

TENNESSEE—The State Highway Department has opened a new 20.7-mile stretch of concrete pavement near Atwood. In the construction the contractor averaged 1000 feet per day.

U. S. is Seeking Low-cost Plan for Oiling Highways

LOW-COST METHODS of oil-treating hundreds of thousands of miles of gravel, sand-clay and topsoil highways in the United States are greatly needed. H. S. Fairbank, engineer of the Bureau of Public Roads, Department of Agriculture, stated October 30 in announcing that a detailed study of this problem would be inaugurated by the bureau.

In explaining highway needs before the recent asphalt paving conference at West Baden, Ind., Mr. Fairbank said that traffic on thousands of miles of dirt roads was such as to require a smooth, dustless surface, but was not great enough to warrant cementing or other costly systems of hard surfacing.

His discussion of research work to be conducted by the bureau is reported by the United States Daily as follows:

A joint technical committee created in March and representing the asphalt industry and the bureau proposes to make a detailed study of the results of the methods of bituminous treatment developed in many parts of the country, to study the efficacy of the methods of applying and mixing asphalt and aggregates, to analyze the asphaltic materials actually used in work done to date and all available materials which might be used, and to build and study experimental roads of various types. Some of this work has been under way for some time.

A detailed analysis of the methods, materials, cost, and service of the various types of low-cost surfaces thus far developed in various localities will be made. Among the types to be studied are the sand-clay and topsoil surface treatments in the southeastern states; sand-asphalt surfaces in Massachusetts, North Carolina, and other states; bituminous treatments of clay roads in Illinois, and elsewhere; the retreated method of Indiana and somewhat similar treatment of stone roads in other states; the so-called blotter treatment of gravel roads in Minnesota and adjacent states; oiled sand roads in California, Nebraska, Nevada, and elsewhere; and in the mixed-in-place treatment of fine-crushed rock and gravel surfaces, which has reached its highest development in the western states.

Studies have already been made of surfacing treatments of sand-clay and topsoil in Florida and South Carolina, and also of oil treatments of clay roads in Illinois and of the retreated method in Indiana. The data gathered by engineers of the bureau, the asphalt industry, and the respective states, are being analyzed and reports on the three types will be published shortly.

Studies of the efficiency of construction methods and equipment are being conducted by the bureau with the advice and assistance of the asphalt industry. These studies are similar to those previously made by the bureau in grading and concrete and bituminous pavement construction.

The study and analysis of the available bituminous materials is the particular responsibility of the industry, under the plan of cooperation that has been agreed upon.

The construction and study of experimental roads has been started and will be actively prosecuted, mainly by the Bureau of Public Roads, in cooperation with several of the state highway departments, but always with the active assistance and advice of representatives of the asphalt industry.

THREE EXPERIMENTS IN PROGRESS

Three experiments are now in progress. One is the continuation of surface treatments of topsoil in South Carolina; another is a series of experiments in California involving the treatment of fine-crushed rock and gravel surfaces with several types of bituminous materials by surface treatment and mixing in place; the third is a series of experiments in the treatment of sandy soil in the sand-hill section of Nebraska with various asphaltic materials.

There is today a need for low-cost methods of improving hundreds of thousands of miles of highways in the country, consisting of gravel, sand-clay, and topsoil and graded and drained earth roads. The traffic on these roads is such as to require a smooth, dustless year-round surface, but not great enough to justify the costlier high-type surfaces.

DUST NUISANCE COMBATED

About six years ago the bureau first became interested in the development of low-cost surfacings, using bituminous materials to lay the dust and reduce the loss of surfacing material. At that time, increase in traffic on the forest roads, which had been constructed under supervision of the bureau, gave rise to a dust nuisance and loss of surfacing material. The forest roads had a surfacing of finely crushed rock or gravel, which had been adequate for traffic up to that time. A similar type of surface had been adopted by a number of the western states and a rather considerable mileage had been built.

Oregon and California took the lead in the experimental use of petroleum oils by various methods. Later the bureau joined with the California highway department in an investigation of the various methods that had been tried with a view to ascertaining what methods or combination of methods and materials would afford the greatest relief. At about the same time the bureau was cooperating with the highway commission of South Carolina in similar experiments of topsoil roads.

"A task without a vision is drudgery,
A vision without a task is a dream,
But a task with a vision is the hope of the world."
—*Cornelia Adair*

BUT NOT OLD CARS

Our house contained some furniture
That we had thought were freaks;
An antique dealer came along,
And said they were antiques.
And for a chair and an old settle
He paid a sum that staggered me.
I said: "This system's very fine—
It ought to work on cars;
My bus is old and very rare—
I'll take it down to Starr's";
The sum he offered was immense,
It staggered me—"twas thirty cents.

—*Georgia Highways.*

"I can't marry you," said the justice of the peace to the nervous bridegroom. "If this girl is only seventeen you will have to get her father's consent."

"Consent!" yelled the groom. "Say, who do you think this old guy with the rifle is, Daniel Boone?"

People differ on all the essentials to success except one, and on that one they all agree—it is **HARD WORK.**

State Highway Progress Reports

ALAMEDA COUNTY

Hanrahan Company of San Francisco, contractors, have the 8.8 miles of state highway reconstruction between Hayward and Niles well under way. The concrete shoulder and asphalt surfacing, including a small portion of 30-foot concrete pavement, is rapidly progressing, a considerable portion of the Portland cement concrete having already been placed. The asphalt concrete surfacing has commenced and a large portion of the base course has been laid. The placing of the surfacing course is now under way and the contract should, in a very short time, present a nearly complete appearance. A considerable portion of the grading of shoulders is yet to be done, together with the construction of side road approaches, before the road can be thrown open to full use of traffic. All structures are completed; which include the widening of a number of concrete structures and the widening of corrugated pipe culverts.

Considerable improvement is to be made at the north end of the town of Niles. The plan here was the reconstruction of the curved road approaches using the longest possible radii, giving the greatest visibility and throwing the intersection with the counter road to Niles Canyon some 200 feet northeasterly of the underpass. The underpass formerly had a 5-foot sidewalk on split grade along the westerly side. This sidewalk is to be torn out, as a pedestrian underpass has already been installed under the railroad tracks west of the underpass structure. This improvement, while a seemingly minor one, is a particular advantage to traffic, as it increases the roadway width in the clear to 28 feet.

During the interim all local and through traffic is being handled along the work.

ALPINE COUNTY

Widening operations between Markleeville and Woodfords have just been completed and surfacing with crushed gravel is under way and will be completed by January 1, 1930, placing this section in good shape for winter travel.

AMADOR COUNTY

Hemstreet and Bell have completed placing crushed rock surfacing on the newly graded section of the Mother Lode Highway between Dry Town and Amador City. This rock surfacing will be armor coated next spring. Jess Cole was the resident engineer on the grading and surfacing.

BUTTE COUNTY

The contract from Oroville to Feather River, a distance of four miles on the Feather River lateral, Ariss Knapp Company, contractors, is proceeding

normally. The work will probably be completed late in January unless exceedingly bad weather conditions prevail.

CALAVERAS COUNTY

The new grade on the Mother Lode Highway between Mokelumne Hill and San Andreas has been surfaced with crushed gravel by the Adams Company.

FRESNO COUNTY

The old Herndon Bridge, which served traffic for 25 years, has at last been demolished, having been replaced by the modern structure on the west side of the Southern Pacific tracks, which was completed early last summer, eliminating two dangerous grade crossings.

Tieslau Bros. has completed its contract for surfacing with premixed oil and rock from Coalinga to 7 miles west on the Sierra-to-the-Sea Highway.

Convict Camp Number 19 in the Kings River Canyon is making good progress and already some four or five miles of completely graded highway provides an excellent example of what this modern mountain scenic highway is to be. The entire personnel, including free men and convicts, are taking a keen interest in their work and are endeavoring to make not only the highway but also the reputation of Camp 19 somewhat above the average.

IMPERIAL COUNTY

Los Angeles-Imperial Valley Route—Contractor A. M. Peck of Los Angeles is starting work on a 10.4-mile Portland cement concrete paving project from Brawley to 4 miles west of Westmoreland. The new pavement will be 20 feet wide and will be laid on a sand cushion placed on top of the existing oil-treated surfacing.

Borderland Highway—Bids will be opened for paving from El Centro to Holtville on January 22. The improvement will consist of a 20-foot pavement laid on a sand cushion over the existing oil-treated surfacing.

A contract has been awarded to R. E. Hazard Contracting Company of San Diego for asphalt concrete widening and resurfacing from Dixieland to Seeley.

Bids will be opened January 15 for alignment improvement and cement concrete pavement from Myers Creek Bridge to 3 miles west of Coyote Wells. The pavement destroyed by floods in December, 1926, will be replaced with this project. Over part of this project the roadbed was constructed under a previous contract.

KERN COUNTY

State forces have placed 8 miles of nonskid surface on the slippery portions of the long tangent south

of Bakersfield and are now engaged in placing sand and gravel borders and oil-mixing same. It is hoped that this work will reduce the number of accidents on this road.

Hartman Construction Company was successful bidder for two miles of realignment and macadam surface on the Cholame Lateral between Wasco and Lost Hills. This work will be started at once and will eliminate two very dangerous right angle turns.

Force-Curragan & McLeod, Contractors, have completed grading and surfacing with oil-treated crushed gravel 11.5 miles of State Highway Route 57 from east city limits of Bakersfield to within one mile of the mouth of Kern Canyon on the Kern River road. A portion adjoining the city of Bakersfield was graded to a wide turnpike section in view of the fact that a considerable proportion of adjacent land is subdivided into lots and built into a residential section. The remainder of the route is a 24-foot roadbed with a 20-foot oil-treated surfacing. The easterly three miles has been changed radically from the former highway, the curvature has been radically reduced and about 0.5 mile of distance saved. Construction of a line change involved a large cut and fill each with a maximum depth and height of 70 feet, involving about 70,000 cubic yards. The resulting highway has caused much favorable comment.

KINGS COUNTY

Day labor forces under Foreman Milford are widening the roadway west of Lemoore and covering the adobe soil on the roadsides with a sand surface, which will remedy the slippery condition heretofore encountered after every rain.

LASSEN COUNTY

The contract between Goodrich and Coppervale, Doveri & Company and J. A. Maddox, contractors, is proceeding. While the long dry spell this fall was a great boon to these contractors, they will be unable to complete their work this year under normal conditions. However, the job is in such condition that it will carry traffic without difficulty during the winter months as all of the newly graded road which will be used by traffic has been surfaced.

Hein Brothers and Chittenden, who have a contract from Susanville to Milford, for surfacing and stockpiling screenings, are nearing completion of this contract. It is anticipated that with the weather holding good they will finish about January 10.

LOS ANGELES COUNTY

The contract for a line change immediately north of the Newhall Tunnel has been awarded to McCray Co. Normal progress is being made on this work. It is expected that this contract will be completed next June.

The work of grading the Newhall Alternate Line between Tunnel Station and the Santa Clara River is completed. LeTourneau and Lindberg were the contractors. It consisted of grading a 46-foot roadbed, 8.6 miles long, and eliminates from this route the Newhall Tunnel and several dangerous curves in the vicinity of Newhall and Saugus. Work is to be started immediately on paving this section with Portland cement concrete, 30 feet wide.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of 40-foot roadbed was awarded to H. W. Rohl Company on August 14th. Rough grading is in progress on one and one-half miles.

LOS ANGELES AND VENTURA COUNTIES

A contract for oil mix shoulders between Calabasas and Conejo Summit has been awarded to the Southwest Paving Company. It is expected that this contract will be finished in April.

MADERA COUNTY

A. Teichert & Son, Contractors, have completed about half of the surfacing on their contract for widening and resurfacing with asphaltic concrete from Califa to the north county line.

The Valley Paving Company has completed the paving from Califa to Berenda.

The subway connection and wyes connecting with Route 32 are still to be paved. This work, together with that of A. Teichert & Son, adjoining, and the subway at Califa, will, when completed, furnish a modern, 20-foot highway free from grade crossings between Merced and Fresno.

Otto Parlier has the contract for the subway at Califa, which connects the above two jobs and his work will be completed shortly after the pavement is finished.

MARIN COUNTY

Marin County has been the scene of considerable highway activities during the past year. A very large sum of money has been expended in the reconstruction work along Route 1 (the Redwood Highway). Some of the more important jobs have been the reconstruction of the Point San Quentin Road from San Rafael to San Quentin, a distance of three miles, where the roadbed was raised to an elevation above high water and widened, a portion of it being constructed 40 feet wide. This new section affords the East Bay cities an adequate connection to the Redwood Highway.

In line with the Commission's policy of reconstructing the state highway obviating the dangerous Corte Madera grade and the numerous small towns adjacent to the existing road, the contract awarded May, 1929, to Granfield Farrar & Carlin, is now practically completed in so far as the grading of the new way is concerned, which, by way of direction, extends very nearly in a straight line from Alto to San Rafael. This new aligned portion has not been opened to traffic, nor will it be, until the completion of the surfacing contract, which will be let in the near future.

Contracts have been recently awarded to:

1. Bids for the construction of an overhead crossing of the Northwestern Pacific Railroad at detour, about one-half mile south of Greenbrae, were recently received.

2. A second contract has been awarded to Fredrickson & Watson for the construction of an overhead crossing of the Northwestern Pacific Railroad's main line tracks at California Park. Here an extensive structure is contemplated, including a long steel truss span with approach steel beam spans and timber trestles on pile and frame bents.

3. A contract has but recently been awarded to the Butte Construction Company of San Francisco for the construction of the Corte Madera Creek bridge, including a small bascule span approximately 40 feet of clear width of opening.

These three structure contracts are planned to be completed by July 1, 1930, together with the surfacing contract from San Rafael to Alto, when they all can be opened to carry the heavy Redwood Highway traffic. At the southerly end at Alto, we have recently reported the completion of the overhead crossing of the Northwestern Pacific Railroad at Alto, together with approximately 0.6 mile of approaches, which completes that portion of Route 52 at the westerly termini at Alto. This new connection will also serve as a temporary connection with the new reconstructed highway which eventually is to extend from Sausalito to San Rafael, funds for which have been provided in the present budget; and it is hoped that the construction will be under way during the early summer of 1930.

Immediately north of San Rafael, the Commission has under way a contract 1.8 miles in length from Gallinas Creek to San Rafael, Granfield Farrar & Carlin of San Francisco being the contractors. This project covers the construction of heavy graded roadway which will be surfaced with bituminous macadam and Portland cement concrete on the excavated sections. This work is progressing rapidly and the contractor is endeavoring to get as much grading work done as possible prior to the heavy rains, in order to take advantage of the settlement of the fills.

The heavy cuts on the contract just north of San Rafael have been opened and much material moved. This work does not interfere with through travel as most of it is on an extensive line change and the old road is open to traffic with no obstructions. It is expected that a contract will soon be let to construct an overhead crossing over the tracks of the Northwestern Pacific Railroad at Forbes and that the completion of roadway will coincide with the completion of the overhead crossing and allow the section to be opened about the middle of the year.

MARIN AND SONOMA COUNTIES

In order to complete the reconstruction of the highway between Petaluma and San Rafael, the 11.9-mile section between one mile south of Petaluma and Ignacio is under reconstruction by Haurahan Co., contractors. Grading is approximately three-fourths complete with construction of concrete boxes, corrugated metal pipe culverts and cattle passes practically completed. With the settlement of the new fills during the winter rains, a bituminous macadam surface will be placed on all new alignment and second story concrete pavement will be placed on the old road wherever practicable. The concrete bridge and stream approaches on the new line at Novato Creek have recently been completed by W. L. Proctor, contractor. The improvement of this section, together with the previously noted section just north of San Rafael, will furnish a 20-foot roadway from San Rafael to Petaluma and should be ready to carry the mid-summer heavy traffic. At San Antonio Creek on a line change and to take the place of the structure on the old road, a contract has been awarded to McDonald & Maggiora of Sausalito for the construction of a reinforced concrete bridge on a new line which will materially shorten the distance over the existing roadway.

An outstanding saving in the highway activities in

Marin-Sonoma counties is the shortening of the distance by the reconstruction work. The present distance from Santa Rosa to Sausalito is approximately 52 miles and, upon the completion of reconstruction, will be reduced nearly 5 miles when the last section from Alto to Sausalito will have been completed during 1930-1931.

MENDOCINO COUNTY

The construction of three timber bridges with approaches and several line changes on the McDonald-to-the-Sea road is practically complete. The contractor, W. C. Colley of Berkeley, has a little finishing work yet to do; the graded sections are surfaced and this section will be much appreciated by the traveling public when the rains are finished and free use of the road is possible.

MERCED COUNTY

Day labor forces under Superintendent Nelson are widening three narrow bridges on the main Valley Highway north of Merced. This work will remove the last "bottleneck" on this road.

The Pacheco Pass Road west of Los Banos is being widened by maintenance forces under Foreman Berry. Material is being hauled from the narrow cuts and the roadway graded to a 30-foot width.

NAPA COUNTY

Fredrickson & Watson Construction Co. and Fredrickson Bros. have brought their contract on the road from Napa Wye to Solano County line so close to completion that a week of good weather will finish it. Traffic is enjoying this section together with the adjacent section to the north as recently completed by the same contractor, and as this road is one of the principal connections between the bay cities and Sacramento and the central and northern sections of the state, these improvements are a benefit to both tourist and business traffic.

ORANGE COUNTY

The contract for a line change 0.7 of a mile in length between Serra and San Juan Capistrano was awarded to Matich Bros. on August 12th. This work consists of constructing a 40-foot graded roadbed with Portland cement concrete pavement, 20 feet by 7 inches. Work is nearly completed.

A contract for paying one-half width between Santa Ana and Anaheim was awarded on June 11th to Griffith Company. This section is 4.9 miles long. The paving work is being done in cooperation with Orange County, the state paying for a strip of pavement 28 feet by 7 inches and the county paying for a like amount. The state's portion of this highway is completed, and work is in progress on the county's portion.

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90- to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Maceo Construction Co. When this work is completed the pavement will be 50 feet

wide for the entire distance. Work is getting under way on this contract.

PLUMAS COUNTY

A contract in Plumas County from the westerly boundary to two and one-half miles southwest of Chester was completed in October by Charles Harlowe, Jr., contractor. The section immediately to the west of this contract between the county line and Morgan Springs in Tehama County was completed about the same time by Johnson Brothers of Portland, under the direction of the Bureau of Public Roads. These two jobs eliminate the high summit at Feather River Meadows and make it possible to maintain this road during the winter months with greater ease, owing to the lower level and the lighter snowfall. Since the completion of these two jobs, arrangements have been made to handle the snowfall during the coming winter, and equipment is on the ground awaiting the first fall.

PLUMAS AND TEHAMA COUNTIES

A contract was recently awarded to E. B. Bishop and covers the construction of a primary highway from a point two and one-half miles southwest of Chester to the Lake Almanor causeway, and also, the production of screenings for next season's armor coat work from Morgan Springs to Lake Almanor causeway. It is doubtful if the work will start before the spring.

RIVERSIDE COUNTY

Riverside-Ontario Route—Bids will be opened January 22 for grading and paving through the new undergrade crossing under the tracks of the Union Pacific Railroad Company.

Plans are being prepared for the widening of three narrow bridges between Riverside and Ontario.

SACRAMENTO COUNTY

Due to the lack of rain this fall, the grading and surfacing job between Arno and McConnell, the main Valley Highway south of Sacramento, has practically been completed. The firm of Larsen Brothers is the contractor. A. K. Nulty is resident engineer.

SAN BERNARDINO COUNTY

Foothill Boulevard—The Steele Finley contract for widening and resurfacing the Foothill Boulevard from the east city limits of Claremont to Cherry avenue is now complete. The work consisted of widening the existing 18-foot pavement to 30 feet.

Arrowhead Trail—The Gist and Bell contract for realignment of approximately 4 miles near the summit of Cajon Pass is nearing completion.

The George Herz Company is making excellent progress with the grading on their contract between Barstow and Yermo. This contract includes the laying of oil-treated plant-mixed surfacing 20 feet wide.

The Dillon and Boles contract for grading and oil-treated surfacing from Yermo to Dunn has been completed.

National Old Trails Highway—A contract for grading and plant-mixed oil-treated surfacing from 4 miles west of Hector to 2 miles west of Argos is complete. This work was done by the Allied Contractors, Inc.

Two new contracts have been awarded to the New Mexico Construction Company, extending the improvement of the Old Trails Highway from 2 miles west of Argos to 1½ miles west of Siberia and from 1½ miles west of Siberia to 6½ miles east of Amboy. The contractor has started work on both projects.

Crest Route—A contract has been awarded to Lewis Construction Company for completion of the gap between 4½ miles west of Running Springs Park and Squirrel Inn.

SAN DIEGO COUNTY

Work is nearly completed on constructing oil rock borders on portions of the Coast Route between the city limits of San Diego and Oceanside. The R. E. Hazard Contracting Company of San Diego are the contractors.

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 46-foot graded roadbed. About two miles have been graded to date.

The contract for grading a roadbed 36 feet wide and placing of Portland cement concrete pavement 20 feet by 7 inches is nearly completed between Pine Valley and Kitchen Creek on the San Diego-El Centro Highway. Basich Brothers are the contractors.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. Grading is completed for a distance of about four miles.

A contract for grading 3.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. About three miles of rough grading is completed, and grading is now in progress on about one mile. This section is on the San Diego-El Centro Highway.

SAN JOAQUIN COUNTY

The lack of the usual fall rains has enabled two contracts in San Joaquin County to be much nearer completion than would normally have been the case. Contractor C. W. Wood has completed laying the concrete pavement between Banta and the San Joaquin River on the main road between the San Joaquin Valley and the bay region. This job eliminates a dangerous stretch of narrow old county built macadam. The shoulder grading alone remains to be done.

The two line changes on the Hogan Road on the main Valley Highway south of Stockton have been graded and surfaced by the firm of Lilly, Willard & Biasotti. This job is nearly complete.

SAN MATEO COUNTY

H. W. Rohl, contractor on the section of the Bayshore Highway, San Francisco to South San Fran-

cisco, has completed his work with the exception of the section through the deep cut at Sierra Point where extensive slides prevent finishing roadway. Also, the Spring Valley Water Company's pipe line as situated on the hillside above the cut, is to be relocated to lie in the roadway, digging of trench being under way.

In the meantime a small amount of the contractor's equipment is being kept to care for the cut during the rainy season.

A contract is being advertised to continue the Bayshore Highway construction by building the section from San Mateo to Redwood City, for which bids will be received on January 8th.

SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES

The section of the Skyline Boulevard between the La Honda Road and Saratoga Gap has been completed.

Twohy Bros. Co. and J. F. Shea Co., contractors on grading and surfacing, have completed their work and Tieslau Bros. having furnished screenings, the state forces have constructed an armor coat oil surface. This opens the boulevard from San Francisco to the gateway into the California Redwood Park and allows of another through route to Santa Cruz. Due to the fact that California Redwood Park Road is an unsurfaced, graded roadway, it will be closed to traffic during the winter of 1929 and 1930.

SANTA CLARA COUNTY

The program for the improvement of the Peninsula Highway between Palo Alto and Santa Clara is proceeding satisfactorily. The section between Sunnyvale and Santa Clara has been completed by Contractor N. M. Ball and he is just completing a channel change of Calabazas Creek under day labor contract. This change is of major importance as the stream paralleled the roadway on the easterly side for over 3000 feet and was so close to the pavement as to forbid widening on that side, and even threatened the existing work, causing heavy maintenance with a permanent type of retaining structure necessary in the near future. After many attempts to come to an agreement with property owners, permission was obtained to continue Calabazas Creek across the property to the east, and following the eastern boundary of the property, empty into the channel of Campbell Creek about one-fourth mile east of the present connection. The original channel is being filled with material from neighboring dykes and from a private borrow pit.

The section from Palo Alto to San Antonio avenue is being advertised for bids to be opened January 8, 1930, and the connecting section, San Antonio avenue to Sunnyvale, is to be advertised early in the spring, so that the end of 1930 should see the entire 13 miles from Palo Alto to Santa Clara completed with Portland cement concrete widening and asphalt surface, a total width of 30 feet as compared to 20 feet existing.

The pavement of that portion through Palo Alto from San Francisquito Bridge to the south city limits of Mayfield (Palo Alto) is to be 40 feet wide.

SHASTA COUNTY

Grier and Taylor who have a contract for furnishing and hauling surfacing material from the end of the

pavement to La Moine, are setting up their plant at Pollock and will be ready to operate about January 10. Their plan is to supply all of the material from this one plant as it is centrally located and will speed up the job by eliminating additional setups although a much longer haul is involved.

SHASTA AND TRINITY COUNTIES

The contract for surfacing and screenings from Weaverville to Tower House on the Trinity Lateral was completed by A. Milne, contractor, on December 10, just in time to escape the delay incidental to the heavy rain immediately following.

Contractors in this district, as well as over the entire state, have been especially fortunate this fall with weather conditions. Normally, road work is hampered by stormy weather early in October. In higher altitudes it is necessary to close down most jobs on account of snow. However, with the exception of the stormy period between December 8 and 17, the weather has been warm and dry and ideal for highway construction.

SISKIYOU COUNTY

The contract of T. M. Morgan Paving Company, contractors, between Shasta River and Gazelle, is nearing completion. The 7-mile stretch of pavement which was under construction on this job was completed last month and was opened to traffic on December 10. The opening of the pavement was very opportune as the detour which was in use between Edgewood and Gazelle was through adobe country on which only a light coat of surfacing had been placed to carry the traffic through summer months. During the week following the opening of the pavement, this detour undoubtedly became impassable although no traffic was routed over it. Unless bad weather conditions prevail, the Morgan Company will complete their contract during the month of January.

The contract for reconstructing a short piece of pavement 0.6 of a mile in length at Spring Hill near Mt. Shasta City has been completed and was opened to traffic on December 8. This reconstruction eliminates a very dangerous 200-foot radius curve at the foot of Spring Hill where numerous accidents have occurred during the past few years. The grading for this improvement was completed by Young Brothers, contractors, earlier in the year, following which the paving contract was let to the Mathews Construction Company, who have now completed their portion of the work.

Beerman and White have been awarded a contract for the producing of surfacing material and screenings between Gazelle and Yreka. They have one plant operating at Gazelle and will start another plant on the Yreka end about January 10. The hauling of the material is being handled by O. McKeynolds on a separate contract.

SOLANO COUNTY

A serious traffic hazard on a heavily traveled highway has been eliminated by the completion of the grading and asphalt macadam surfacing of the stretch of road from the Napa County line easterly through The Jameson Canyon. This is the highway connecting

the Napa Valley and Redwood Highway country with the Sacramento Valley. The firm of Fredrickson & Watson and Fredrickson Brothers was the contractor. The moving of several miles of pipe line supplying the city of Vallejo was also involved.

TEHAMA COUNTY

A. F. Giddings has completed his setup near Battle Creek on the Red Bluff-Susanyville laterat and is ready to operate. The surfacing will be spread westerly from the plant to Paynes Creek during the winter as it is desired to have this portion well compacted for next summer's oil program. The remainder of the surfacing and stockpiling from the plant to Morgan Springs will follow during the spring months.

TRINITY COUNTY

Recent rearrangements of the convict forces employed on construction in the state have resulted in a reduction of forces at Camp 12, located in Trinity County 25 miles west of Redding, to a force of 55 men. The work of this camp will be concentrated upon the completion of the section in Shasta County immediately west of the Buckhorn Summit. This work is now completed to within about a mile of the summit and its use will eliminate a very long, heavy climb several miles in length on the existing county road. This work should be completed during the coming season and will enable traffic to make use of the new construction next winter. As the road on the Trinity side is on comparatively light grades, work on it will be delayed until a later date.

TULARE COUNTY

The Valley Paving Company is making rapid progress on its contract for widening and resurfacing on the Golden State Highway between Delano and Pixley. H. B. La Forge is Resident Engineer for the state.

Bids will be opened January 2d on a contract for resurfacing from Pixley to Tipton on Route 4.

TUOLUMNE COUNTY

The Adams Company has been awarded the contract for surfacing the newly graded section of the Mother Lode Highway between near Shaws Flat and the Columbia-Sonora Road. This lies a short distance north of Sonora. Work has started.

Just east of Sonora a grading and surfacing job between Sonora and Sullivan Creek has been completed by Lilly, Willard and Bisotti. This road carries a heavy traffic for a mountain road and the improvement is much appreciated by the local people.

VENTURA COUNTY

A contract for second story paving with asphaltic concrete from Conejo Creek to Carmarillo has been awarded to Griffith Company. Work is just starting on this contract.

Record of Bids and Awards

HIGHWAY BID OPENINGS AND AWARDS

From Nov. 27 to Dec. 26

IMPERIAL COUNTY—Between Brawley and 4 miles west of Westmorland grading and paving with Portland cement concrete 10.4 miles. Dist. VII, Rt. 26, Sees. 11 and A. Griffith Company, Los Angeles, \$338,519; E. Paul Ford, San Diego, \$353,319; R. E. Hazard Contracting Co., San Diego, \$353,785; McCray Co., Los Angeles, \$341,908; Jahn & Bressi, Los Angeles, \$325,737; Basich Brothers, Los Angeles, \$349,140; George Herz & Co., San Bernardino, \$335,115; Watson & Sutton, San Diego, \$335,195; T. M. Morgan Paving Co., Gazelle, \$365,637; Sander Pearson, Santa Monica, \$333,048; J. F. Knapp, Oakland, \$349,477. Contract awarded to A. M. Peck Company, Los Angeles, \$312,057.05.

IMPERIAL COUNTY—Between Dixieland and Seeley, 5 miles to be graded and paved with asphalt concrete. Dist. VIII, Rt. 12, Sec. C. Basich Bros., Los Angeles, \$113,522; Y. R. Dennis Const. Co., San Diego, \$135,922; Gibbons & Redd, Burbank, \$140,818; Ben Pearce Const. Co., San Diego, \$129,910. Contract awarded to R. E. Hazard Contracting Co., San Diego, \$110,426.30.

LOS ANGELES COUNTY—Reinforced concrete arch bridge across La Canada Canyon $1\frac{1}{2}$ miles northeast of La Canada. Dist. VII, Rt. 61, Sec. A. E. S. Johnson, Pasadena, \$33,433; George J. Ulrich Const. Co., Modesto, \$43,788; Oberg Bros., Los Angeles, \$32,061; Sharp & Fellows, Los Angeles, \$46,388; John Simpson Co., Los Angeles, \$35,951; William J. Shirley, Los Angeles, \$38,182; A. R. and C. O. Bodenhamer, Hemet, \$42,828; Sydney Smith Contracting, Los Angeles, \$37,182; Carpenter Bros., Inc., Beverly Hills, \$34,717. Contract awarded to Whipple Engineering Company, Monrovia, \$31,419.75.

LOS ANGELES COUNTY—Between Tunnel Station and Santa Clara River, 8.5 miles to be paved with Portland cement concrete. Dist. VII, Rt. 4, Sec. F. Will F. Peck Company, Los Angeles, \$277,270; J. F. Knapp, Oakland, \$287,560; McCray Company, Los Angeles, \$288,366; Basich Brothers, Los Angeles, \$280,975; Fredrickson & Watson, Oakland, \$324,435; Griffith Company, Los Angeles, \$293,836; Wells and Bressler, Santa Ana, \$282,044; O. A. Lindberg, Newhall, \$329,864. Contract awarded to Jahn and Bressi, Los Angeles, \$253,126.

ORANGE COUNTY—Between Dana Point and Serra, 0.2 of a mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 60, Sec. C. Chas. and George K. Thompson, Los Angeles, \$13,543; Western Construction Company, \$14,725. Contract awarded to Matich Bros., Elsinore, \$12,583.

SAN BERNARDINO COUNTY—Between 4.5 miles west of Running Springs and Squirrel Inn, 6.7 miles to be graded. Dist. VIII, Rt. 43, Sec. B. W. H. Hauser, Oakland, \$253,513; Isbell Const. Co., Fresno, \$225,299; Triangle Rock & Gravel Co., \$232,012; Kern Contracting Co., Bakersfield, \$251,641; Yglesias Bros., Inc., San Diego, \$270,709; Gist & Bell, Arcadia, \$238,465; J. G. Donovan & Son, Los Angeles, \$202,920; Wm. C. Horn Co., Puente, \$228,649; Mutual Income Properties, Los Angeles,

\$244,303; J. F. Knapp, Oakland, \$251,219; Nevada Contracting Co., Fallon, Nevada, \$244,647; O. A. Lindberg, Newhall, \$213,510. Contract awarded to Lewis Construction Company, Los Angeles, \$189,687.

TEHAMA COUNTY—6 timber bridges at various points east of Red Bluff, total length approximating 665 feet, bridge decks to be surfaced with bituminous macadam. Dist. H, Rt. 29, Sec. A. Brunk and Case, Corning, \$24,970; E. B. Skeels, Roseville, \$25,616; Lord and Bishop, Oroville, \$24,990; A. Young, Yreka, \$27,125; R. B. McKenzie, Red Bluff, \$23,925; J. P. Brennan, Redding, \$26,103; M. A. Jenkins, Sacramento, \$24,865; M. B. McGowan, San Francisco, \$25,990. Contract awarded to F. H. Nielson, Orland, \$22,504.

TEHAMA-PLUMAS COUNTIES—Between Morgan Springs and Lake Almanor. Grading and surfacing with untreated crushed gravel or stone, 21.7 miles. Dist. H, Rt. 29, Secs. C and A. Contract awarded to E. B. Bishop, Sacramento, \$59,265.

YUBA COUNTY—Buildings, appurtenances, and utilities to be moved from within to without the limits of the state highway right of way at Wheatland. Dist. H, Rt. 3, Sec. A. William Grebe, Sacramento, \$4,649; McDaniels & Burroughs, Marysville, \$3,029. Contract awarded to O. F. Brown, Sacramento, \$2,347.

ACCEPTANCES OF HIGHWAY CONTRACTS

AMADOR COUNTY—Contract for producing and placing untreated crushed rock surfacing between Drytown and Amador City, Mother Lode Highway, 2.7 miles, at an approximate cost of \$28,100. Hemstreet & Bell of Marysville, contractors.

EL DORADO COUNTY—Contract for surfacing with untreated crushed gravel between Logtown and 4 miles southerly, about 4 miles, approximate cost \$12,850. Hemstreet & Bell of Marysville, contractors.

FRESNO COUNTY—Contract for placing premixed oil-treated surfacing on crushed gravel base from three miles east of Parkfield Junction to Coalinga, 6.7 miles, at an approximate cost of \$53,800, has been satisfactorily completed in accordance with the plans and specifications. Tieslau Brothers of Berkeley, contractors.

HUMBOLDT COUNTY—Contract for producing and stockpiling broken stone and screenings between Mill Creek and Little River, Redwood Highway, 6.4 miles, approximate cost of \$18,100. Wm. C. Elsemore, Eureka, contractor.

HUMBOLDT COUNTY—Contract for constructing an overhead crossing and 7 timber bridges at points between one and 3½ miles north of Arcata, Redwood Highway, at an approximate cost of \$57,500. Mercer-Fraser Company, Inc., of Eureka, contractors.

HUMBOLDT COUNTY—Contract for constructing a graded roadbed and placing a crushed rock surfacing from Arcata to a point 0.3 of a mile north of Mad River, Redwood Highway, a length of about 3 miles, at an approximate cost of \$92,700. H. J. Kennedy and Daniel Bayles of Oakland, contractor.

KERN COUNTY—Contract for constructing graded roadbed and placing oil-treated crushed rock surfacing between Bakersfield and 1½ miles east of Cottonwood Creek, 11 miles, approximate cost \$186,800. Force, Curigan & McLeod of Oakland, contractors.

LOS ANGELES-SAN BERNARDINO COUNTIES—Contract for grading roadbed and placing asphaltic

concrete pavement between Claremont and Cherry avenues, 10.4 miles, at an approximate cost of \$234,000 has been satisfactorily completed and accepted. Steele Finley of Santa Ana was the contractor.

MARIN COUNTY—Contract for constructing an overhead crossing over the tracks of the Northwestern Pacific Railroad near Alto, Redwood Highway, approximate cost of \$38,400. Contractors, Tibbitts Construction Company of San Francisco.

MONTEREY COUNTY—Contract for constructing a graded roadbed and placing asphalt concrete pavement between Chualar and Salinas, Coast Route. The Peninsula Paving Company of San Francisco, contractors.

ORANGE COUNTY—Contract for constructing a graded roadbed and placing Portland cement concrete pavement westerly of San Clemente, about 0.2 of a mile, at an approximate cost of \$10,100. Matich Bros. of Elsinore, contractors.

SACRAMENTO-EL DORADO COUNTY—Contract for constructing oil-treated crushed rock borders on both sides of existing pavement between Folsom and Placerville, 28 miles, approximate cost \$77,800. W. H. Larson of Sonoma, contractor.

SAN DIEGO COUNTY—Contract for constructing a bridge across Pine Valley Creek, approximate cost \$48,700. Contractor Linderman and Dueker, Inc., of Harbor City.

SAN JOAQUIN COUNTY—Contract for constructing graded roadbed and placing untreated crushed gravel or stone surfacing between a point 2½ miles north of Turner Station and the Mariposa Road, 1.1 miles, approximate cost of \$38,400. Lilly, Willard and Biasotti of Stockton, contractors.

SAN LUIS OBISPO COUNTY—Contract for constructing a bridge across Graves Creek about 2 miles south of Templeton, at an approximate cost of \$11,000. William Lane of Paso Robles, contractor.

SHASTA COUNTY—Contract for constructing bridge across Mears Creek about 5 miles south of Castell, approximate cost of \$20,000 has been completed. Carlson Bros. of Turlock, contractors.

SISKIYOU COUNTY—Contract for placing a Portland cement concrete pavement at Spring Hill near Mount Shasta, distance of 0.6 of a mile, at approximate cost of \$22,800. Mathews Construction Company of Sacramento, contractors.

TEHAMA COUNTY—Contract for constructing untreated crushed rock shoulders between southerly boundary and Red Bluff, 10.8 miles, approximate cost \$11,600. Hemstreet & Bell of Marysville, contractors.

TRINITY AND SHASTA COUNTIES—Contract for placing crushed stone surfacing between Weaver-ville and Tower House, 22.2 miles, approximate cost of \$81,400 has been satisfactorily completed, etc. A. Milne, Portland, Ore., contractor.

MISSOURI—This state has built 1291 miles of all types of highways this year and will follow next year with 917 miles more, giving it a total of 2876 miles hard surfaced.

NEW MEXICO—All oil surfaced highways built in the future will be twenty feet wide, the State Highway Department has decided, to increase the success of the oil surfacing type of road and to insure its durability. The move to widen roadways has been made in order to overcome shoulder breaks. The greater width of road will combat the tendency, and from experience in other states, will eliminate it.

WATER PERMITS AND APPLICATIONS

Applications for Permit to Appropriate Water, Filed with the State Department of Public Works, Division of Water Resources, During December, 1929.

DEL NORTE COUNTY—Application 6503. C. R. Ward and J. L. Ward, Crescent City, for 0.15 c.f.s. from unnamed creeks tributary to Smith River to be diverted in Sec. 19, T. 17 N., R. 2 E., H. M., for domestic purposes. Estimated cost \$2,000.

SUTTER COUNTY—Application 6504. Frank Berry, Yuba City, for 0.5 c.f.s. from Feather River tributary to Sacramento River to be diverted in Sec. 14, T. 14 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$1,100.

AMADOR COUNTY—Application 6505. Preston School of Industry, State of California, Waterman, for 10 c.f.s. from Sutter Creek tributary to Mokelumne River via Dry Creek to be diverted in Sec. 1, T. 6 N., R. 10 E., M. D. M., for power purposes. Estimated cost \$75,000.

AMADOR COUNTY—Application 6506. Preston School of Industry, State of California, Waterman, for 8.5 c.f.s. and 3750 acre-feet per annum from Sutter Creek tributary to Mokelumne River via Dry Creek to be diverted in Sec. 1, T. 6 N., R. 10 E., M. D. M., for domestic and irrigation purposes. Estimated cost of \$75,000.

SAN BERNARDINO COUNTY—Application 6507. Joseph J. Campbell, Glendale, for 0.02 c.f.s. from underground water tributary to Lake Arrowhead to be diverted in Sec. 21, T. 2 N., R. 3 W., S. B. M., for domestic purposes. Estimated cost \$150.

INYO COUNTY—Application 6508. W. B. Grey, Beatty, Nevada, for 5 c.f.s. from (1) Jail, (2) Birch, (3) Tubler Springs tributary to Jail, Birch and Tubler Dry Gulches to be diverted in Sec. 21 projected, T. 20 N., R. 45 E., M. D. M., and Sec. 20 projected, T. 20 N., R. 45 E., M. D. M., for mining purposes.

NEVADA COUNTY—Application 6509. Nevada Irrigation District, Grass Valley, for 100 c.f.s. from Auburn Ravine tributary to American River to be diverted in Sec. 13, T. 12 N., R. 6 E., and Sec. 22, T. 12 N., R. 6 E., M. D. M., for irrigation purposes.

SAN DIEGO COUNTY—Application 6510. Ed Fletcher, 1020 9th St., San Diego, for 0.15 c.f.s. from unnamed spring tributary to Los Choccos Creek to be diverted in Sec. 13, T. 15 S., R. 1 E., S. B. M., for irrigation and domestic purposes.

LOS ANGELES COUNTY—Application 6511. Ernest E. Pottinger and Ralph Wagner, Saugus, for 0.05 c.f.s. from Drippy Spring tributary to Haskell Canyon Creek to be diverted in Sec. 25, T. 5 N., R. 16 W., S. B. M., for irrigation and domestic purposes.

SONOMA COUNTY—Application 6512. Joe M. Fernandez, Box 490, Sonoma, for 0.22 c.f.s. from Sonoma Creek tributary to San Pablo Bay to be diverted in Sec. 13, T. 5 N., R. 6 W., M. D. M., for irrigation purposes.

TRINITY COUNTY—Application 6513. Trinity Farm and Cattle Company, Redding, for 15 c.f.s. from Trinity River tributary to Klamath River to

be diverted in Sec. 9, T. 36 N., R. 7 W., M. D. M., for irrigation and domestic purposes.

SISKIYOU COUNTY—Application 6514. A. F. Westover, care Geo. G. Underhill, Etna Mills, for 140 c.f.s. from (1) Trail Creek, (2) Fish Lake Creek, (3) E. Br. 6 Mile Creek, and (4) W. Br. 6 Mile Creek tributary to E. Fk. of Salmon River to be diverted in Secs. 25, 15 and 16, T. 39 N., R. 10 W., M. D. M., for mining purposes.

SAN FRANCISCO COUNTY—Application 6515. Karl Brehme, Hobart Bldg., San Francisco, for 200,000 acre-feet from Cache Creek tributary to Sacramento River to be diverted in Sec. 5, T. 10 N., R. 2 W., M. D. M., for industrial and domestic purposes. Estimated cost \$12,000,000.

PLACER AND NEVADA COUNTIES—Application 6516. Bear River Water & Power Co., care J. L. Rollins, Colfax, for 111,020 acre-feet from Bear River and its tributaries tributary to Feather River to be diverted in Sec. 22, T. 15 N., R. 9 E., and Sec. 27, T. 15 N., R. 9 E., M. D. M., from either or both for power purposes. Estimated cost \$2,500,000.

SHASTA COUNTY—Application 6517. Frank Rausch, Dunsmuir, for 0.011 c.f.s. of 7200 g.p.d. from unnamed spring tributary to Sacramento River to be diverted in Sec. 1, T. 38 N., R. 4 W., M. D. M., for domestic purposes. Estimated cost \$275.00.

MODOC COUNTY—Application 6518. Irwin C. Evely, Davis Creek, for 700 acre-feet from Fletcher Creek and Drainage area of Reservoir tributary to Clear Lake Reservoir to be diverted in Sec. 16, T. 47 N., R. 12 E., M. D. M., for irrigation purposes.

MONO COUNTY—Application 6519. W. O. Garner, 450 S. Kenoak, Pomona, for 150 g.p.d. from unnamed spring tributary to Mammoth Creek and Owens River to be diverted in Sec. 9, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$100.

LOS ANGELES COUNTY—Application 6520. Candido Herreres, R. 2, Box 1134, San Fernando, for 1,240,000 gallons per annum from underground water developed from Muerte Canyon tributary to Little Tujunga Canyon to be diverted in Sec. 34, T. 3 N., R. 14 W., S. B. M., for irrigation and domestic purposes. Estimated cost \$2,000,000.

Permits to Appropriate Water, Issued by the Department of Public Works, Division of Water Resources, During December, 1929.

STANISLAUS COUNTY—Permit 3386. Application 6293. Issued to Lloyd B. and Elizabeth M. Crow, San Francisco, December 2, 1929, for 7.5 c.f.s. from San Joaquin River in Sec. 17, T. 6 S., R. 9 E., M. D. M., for irrigation on 480 acres.

SAN DIEGO COUNTY—Permit 3387. Application 6445. Issued to Harold S. Kibbey, Lakeside, December 2, 1929, for .05 c.f.s. from unnamed spring in Sec. 5, T. 15 S., R. 1 E., S. B. M., for domestic use. Estimated cost \$1,000.

SUTTER COUNTY—Permit 3388. Application 6454. Issued to Austin Kramer, Knights Landing, December 3, 1929, for 1.3 c.f.s. from Sacramento River in Sec. 29, T. 12 N., R. 2 E., M. D. M., for irrigation on 104.3 acres. Estimated cost \$5,000.

SAN JOAQUIN COUNTY—Permit 3389. Application 6397. Issued to W. H. McFall, Manteca, December 3, 1929, for 1.47 c.f.s. from Lone Tree Creek in Sec. 14, T. 1 S., R. 7 E., M. D. M., for irrigation on 117.36 acres. Estimated cost \$1,000.

PLUMAS COUNTY—Permit 3390, Application 2186. Issued to Feather River Power Company, San Francisco, December 4, 1929, for 70,000 acre-feet from Bucks Creek in Sec. 25, T. 19 N., R. 3 E., M. D. M., for irrigation on 44,314 acres. Estimated cost \$3,209,500.

SIERRA COUNTY—Permit 3391, Application 6395. Issued to Belle C. Brown and Wm. S. Brown, La Porte, December 5, 1929, for 65 c.f.s. from Whiskey Creek and Unnamed Ravine in Sec. 16, T. 22 N., R. 10 E., M. D. M., for mining. Estimated cost \$2,000.

SIERRA COUNTY—Permit 3392, Application 6396. Issued to Belle C. and Wm. S. Brown, La Porte, December 5, 1929, for 5 c.f.s. from North Branch of Slate Creek in Sec. 21, T. 22 N., R. 10 E., M. D. M., for mining. Estimated cost \$1,000.

BUTTE COUNTY—Permit 3393, Application 6449. Issued to Holly Citrus Land Company, Hollywood, December 6, 1929, for 1.25 c.f.s. from two unnamed streams in Sec. 6, T. 18 N., R. 5 E., M. D. M., for irrigation on 100 acres. Estimated cost \$2,500.

EL DORADO COUNTY—Permit 3394, Application 5989. Issued to E. C. Sawtelle and Mrs. Bess Lewis, Roseville, December 7, 1929, for .01 c.f.s. from unnamed stream in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic use. Estimated cost \$200.

EL DORADO COUNTY—Permit 3395, Application 6431. Issued to V. A. Palmer, Sacramento, December 7, 1929, for .01 c.f.s. from unnamed stream in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic use. Estimated cost \$200.

EL DORADO COUNTY—Permit 3396, Application 6440. Issued to C. H. Parrott, Roseville, December 7, 1929, for .01 c.f.s. from unnamed stream in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic use. Estimated cost \$200.

MONTEREY COUNTY—Permit 3397, Application 6420. Issued to George P. Tolman, Watsonville, December 9, 1929, for .01 c.f.s. from unnamed spring in Sec. 6, T. 20 S., R. 5 E., M. D. M., for domestic use. Estimated cost \$200.

TRINITY COUNTY—Permit 3398, Application 5925. Issued to R. S. Gurley, Hyampom, December 14, 1929, for 1.0 c.f.s. from Allen and Backham Creeks in Secs. 13 and 23, T. 4 N., R. 6 E., H. M., for irrigation on 80 acres. Estimated cost \$1,000.

SANTA BARBARA COUNTY—Permit 3399, Application 6259. Issued to 4 H Club of Santa Barbara, Goleta, December 16, 1929, for 0.1 c.f.s. from Arroyo Burro Creek Canyon and 2 springs in Sec. 12, T. 5 N., R. 28 W., S. B. M., for domestic use. Estimated cost \$2,500.

RIVERSIDE COUNTY—Permit 3400, Application 6400. Issued to O. P. Sanders, Riverside, December 16, 1929, for .025 c.f.s. from unnamed spring in Sec. 8, T. 4 S., R. 2 E., S. B. M., for irrigation on 20 acres. Estimated cost \$750.

SAN JOAQUIN COUNTY—Permit 3401, Application 6430. Issued to C. B. Orvis, Stockton, December 17, 1929, for 12 c.f.s. from State Canal in Sec. 15, T. 4 N., R. 5 E., M. D. M., for agricultural purposes on 960.5 acres. Estimated cost \$6,500.

MONO COUNTY—Permit 3402, Application 6270. Issued to Champion Sillimanite, Inc., Merced, December 18, 1929, for .025 c.f.s. from Dry Creek in Sec. 10, T. 4 S., R. 33 E., M. D. M., for agricultural purposes. Estimated cost \$1,500.

MONO COUNTY—Permit 3403, Application 6271. Issued to Champion Sillimanite, Inc., Merced, December 18, 1929, for .025 c.f.s. from Dry Creek in Sec.

10, T. 4 S., R. 33 E., M. D. M., for agricultural purposes.

MONO COUNTY—Permit 3404, Application 6272. Issued to Champion Sillimanite, Inc., Merced, December 18, 1929, for .05 c.f.s. from Dry Creek in Sec. 10, T. 4 S., R. 33 E., M. D. M., for mining purposes. Estimated cost \$1,500.

PLUMAS COUNTY—Permit 3405, Application 6241. Issued to Feather River Power Company, San Francisco, December 19, 1929, for 120 c.f.s. direct diversion 6,000 acre-feet from Mills Ranch and Bucks Creek tributary to North Fork Feather River in Secs. 5, 6, 7, 12, 18, 19, 20, 29, 32, 34, T. 24 N., R. 6 and 7 E., M. D. M., for power purposes. Estimated cost \$9,531,000.

SACRAMENTO COUNTY—Permit 3406, Application 6434. Issued to Golda G. Whipple, Sacramento, December 19, 1929, for .31 c.f.s. from dry Creek in Sec. 33, T. 10 N., R. 5 E., M. D. M., for irrigation on 25 acres. Estimated cost \$450.

ORANGE COUNTY—Permit 3407, Application 5910. Issued to Rome Miller, Los Angeles, December 20, 1929, for 0.15 c.f.s. from Six Springs in Secs. 9 and 10, T. 5 S., R. 7 W., S. B. M., for domestic purposes. Estimated cost \$3,000.

ORANGE COUNTY—Permit 3408, Application 5911. Issued to Rome Miller, Los Angeles, December 20, 1929, for .05 c.f.s. from an unnamed spring in Sec. 15, T. 5 S., R. 7 W., S. B. M., for domestic purposes. Estimated cost \$500.

VENTURA COUNTY—Permit 3409, Application 6294. Issued to Topa Topa Company, Ojai, December 21, 1929, for 1 c.f.s. from two wells in Sec. 34, T. 5 N., R. 22 W., S. B. M., for irrigation on 122 acres. Estimated cost \$18,000.

HUMBOLDT COUNTY—Permit 3410, Application 6152. Issued to Wm. Campbell, Salyer, December 21, 1929, for 5 c.f.s. from Madden Creek in Sec. 21, T. 6 N., R. 5 E., H. M., for mining purposes. Estimated cost \$2,000.

TRINITY COUNTY—Permit 3411, Application 6373. Issued to Aaron Willburn, Zenia, December 23, 1929, for .56 c.f.s. from West Branch of Bluford Creek in Sec. 5, T. 3 S., R. 6 E., H. M., for irrigation on 45 acres. Estimated cost \$200.

COLUSA COUNTY—Permit 3412, Application 6333. Issued to Northern California Duck Club, Sacramento, December 23, 1929, for 3 c.f.s. from Lurline Creek in Sec. 19, T. 16 N., R. 2 W., M. D. M., for irrigation on .440 acres. Estimated cost \$1,000.

SAN BERNARDINO COUNTY—Permit 3413, Application 6374. Issued to L. C. Wylie, Maywood, December 24, 1929, for 0.1 c.f.s. from two unnamed springs in Glen Canyon in Sec. 23, T. 2 N., R. 6 W., S. B. M., for irrigation on 15 acres. Estimated cost \$900.

TRINITY COUNTY—Permit 3414, Application 5222. Issued to Chester A. Freeman, Salyer, December 24, 1929, for 1 c.f.s. from springs in Sec. 27, T. 6 N., R. 6 E., H. M., for mining purposes. Estimated cost \$400.

TRINITY COUNTY—Permit 3415, Application 6263. Issued to C. A. Freeman, Salyer, December 24, 1929, for 1.0 c.f.s. from unnamed springs in Sec. 2, T. 5 N., R. 6 E., H. M., for mining purposes. Estimated cost \$100.

TRINITY COUNTY—Permit 3416, Application 5770. Issued to W. P. Anderson et al., Weaverville, December 24, 1929, for 1.5 c.f.s. from North Fork Trinity River in Sec. 24, T. 35 N., R. 12 W., M. D. M., for power purposes.

Contracts Provide Improvements of Major Character

A NUMBER of important improvements on the state highway system are assured in awards of contract made during the past 30-day period by B. B. Meek, Director of the Department of Public Works. Some of the more important projects included in these awards are the following:

SAN BERNARDINO-EL CENTRO HIGHWAY—A contract was awarded to the A. M. Peck Company of Los Angeles to grade and pave with Portland cement concrete 10.4 miles between Brawley and 4 miles west of Westmoreland. The contract price was \$312,057.05, making it one of the largest contracts awarded during the year. The roadbed is to be graded to a width of 36 feet and the paving will be 20 feet in width, thus providing for two 10-foot travel paths. The grade of the road is being raised and wide drainage ditches constructed on each side of the highway to eliminate flooding of the roadside from irrigation overflow. The new concrete pavement is to be laid on a sand cushion over the present oil-treated gravel surfacing, thus affording a more adequate roadway for the heavy produce trucking that this artery is called upon to carry.

H. E. Hazard Contracting Company of San Diego received the contract for grading and paving with asphalt concrete 5 miles between Dixieland and Seeley. This pavement will be 20 feet wide and will be placed on sand cushion over the existing oiled surface. The project will construct wide drainage ditches which will eliminate any danger from flooding. Contract price is \$110,426.30.

PACIFIC HIGHWAY—A contract small in amount, but one that will be welcomed by travel inasmuch as it marks an improvement of the highway route through Wheatland in Yuba County was awarded to O. P. Brown of Sacramento for \$2,347. The contract calls for moving buildings, appurtenances and utilities from within to without the limits of the state highway right of way.

CREST ROUTE DRIVE—The Lewis Construction Company of Los Angeles was awarded the contract to grade 6.7 miles from a point west of Running Springs Park to Squirrel Inn. This section is located in the mountains north of San Bernardino and leads to the popular recreational district around Lake Arrowhead and Big Bear Lake. The improvement connects the recently graded highway from the head of Waterman Canyon on the westerly end with the oiled surfaced road to Big Bear on the east. The roadbed will be graded to a width of 28 feet and on a high standard of alignment. The contract price is \$189,687.

RED BLUFF-SUSANVILLE LATERAL—A contract was awarded to E. B. Bishop of Sacramento for grading and surfacing with untreated crushed gravel or stone from Chester to 2½ miles south of Chester, and stockpiling screenings along highway from Morgan Springs to Chester, 21.7 miles in all. This project will complete a continuous improved highway from Dale's Ranch 17 miles east of Red Bluff to Millford, 26 miles east of Susanville. The contract price of this project is \$30,245. This project lies in Plumas and Tehama counties.

ARROYO SECO HIGHWAY—A contract for the construction of a reinforced concrete arch bridge across La Canada Canyon was awarded to the Whipple Engineering Company of Monrovia. The bridge will consist of one 96-foot span and two 25-foot approach spans on concrete abutments with wing walls. The contract price was \$31,419.75.

WATER PERMITS AND APPLICATIONS

(Continued from page 39.)

SOLANO COUNTY—Permit 3417, Application 6444. Issued to A. C. and Minnie T. Sullivan, Winters, December 27, 1929, for 0.37 c.f.s. from Miller or pleasant Valley Creek in Sec. 12, T. 7 N., R. 2 W., M. D. M., for irrigation on 30 acres. Estimated cost \$1,400.

LOS ANGELES COUNTY—Permit 3418, Application 3808. Issued to H. Hay as trustee and San Dimas Water Co., Covina, December 28, 1929, for 16.8 c.f.s. from Pudding Stone Canyon in Sec. 15, T. 1 S., R. 9 W., S. B. M., for irrigation on 4422.21 acres. Estimated cost \$60,000.

SHASTA COUNTY—Permit 3419, Application 6424. Issued to Laura Chandler, Castella, December 31, 1929, for .025 c.f.s. from Mullin's Gulch in Sec. 22, T. 38 N., R. 4 W., M. D. M., for irrigation on 2 acres. Estimated cost \$250.

DEL NORTE COUNTY—Permit 3420, Application 6456. Issued to Russell Reid, Klamath, December 31, 1929, for 0.3 c.f.s. from Branch Creek in Sec. 28, T. 14 N., R. 1 E., H. M., for irrigation on 24 acres.

AWARD OF CONTRACTS DIVISION OF ARCHITECTURE

Dec. 4 to Dec. 22, 1929

NORWALK STATE HOSPITAL, Norwalk, for construction of assistant physician's residence. Contract awarded to T. R. Hyatt of Alhambra; price, \$6,439.

INDUSTRIAL HOME FOR ADULT BLIND, Oakland, for construction of a sales building, and office and addition to warehouse. Contract awarded to J. B. Bishop of Oakland; price, \$13,031.

JUST THINK

Every minute—
A baby is born.
Two husbands get shot.
Three fires break out.
Four girls leave home.
Five girls come back.
Six automobiles wreck.
Seven cashiers go out walking.
Eight people get hurt.
Nine men need automobiles—and—
Ten salesmen are after 'em.—*Exchange.*

She had done everything wrong. She had disregarded the signal lights, then stalled in the middle of the street, and before starting, had taken out her powder puff and started to apply it to her face. An irate traffic cop rushed up: "Say, lady, do you know anything at all about traffic rules?"

"Why, yes, what is it that you want to know?"

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

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B. B. MEEK.....Director

CORNING DE SAULES.....Deputy Director

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CALIFORNIA HIGHWAY COMMISSION

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J. P. BAUMGARTNER, Commissioner, Santa Ana

M. B. HARRIS, Commissioner, Patterson Bldg., Fresno

JOSEPH M. SCHENCK, Commissioner, c/o United Artists Studio, Santa Monica Blvd., Los Angeles

FRED S. MOODY, Commissioner, 640 Kohl Bldg., San Francisco

C. H. PURCELL, State Highway Engineer, Sacramento

GEORGE C. MANSFIELD, Secretary

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T. E. STANTON, Materials and Research Engineer

FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Chief Accountant

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S. V. CORTELYOU, District VII, Los Angeles

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F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
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A. D. EDMONSTON, Deputy in Charge Water Resources Investigation

R. L. JONES, Deputy in Charge Flood Control and Reclamation

GEORGE W. HAWLEY, Deputy in Charge of Dams

SPENCER BURROUGHS, Attorney
EVERETT N. BRYAN, Hydraulic Engineer, Water Rights

A. N. BURCH, Irrigation Investigations

H. M. STAFFORD, Sacramento-San Joaquin Water Supervisor

GORDON ZANDER, Adjudication, Water Distribution

KATHERINE A. FEENY, Chief Clerk

MABEL PERRYMAN, Secretary

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CARLETON PIERSON, Specification Writer

C. O. PALM, Chief Clerk

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J. W. DUTTON, General Superintendent Construction

W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

W. M. CALLAHAN, Electrical Engineer

DIVISION OF MOTOR VEHICLES

FRANK G. SNOOK, Chief

EUGENE BISCAILUZ, Chief of California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

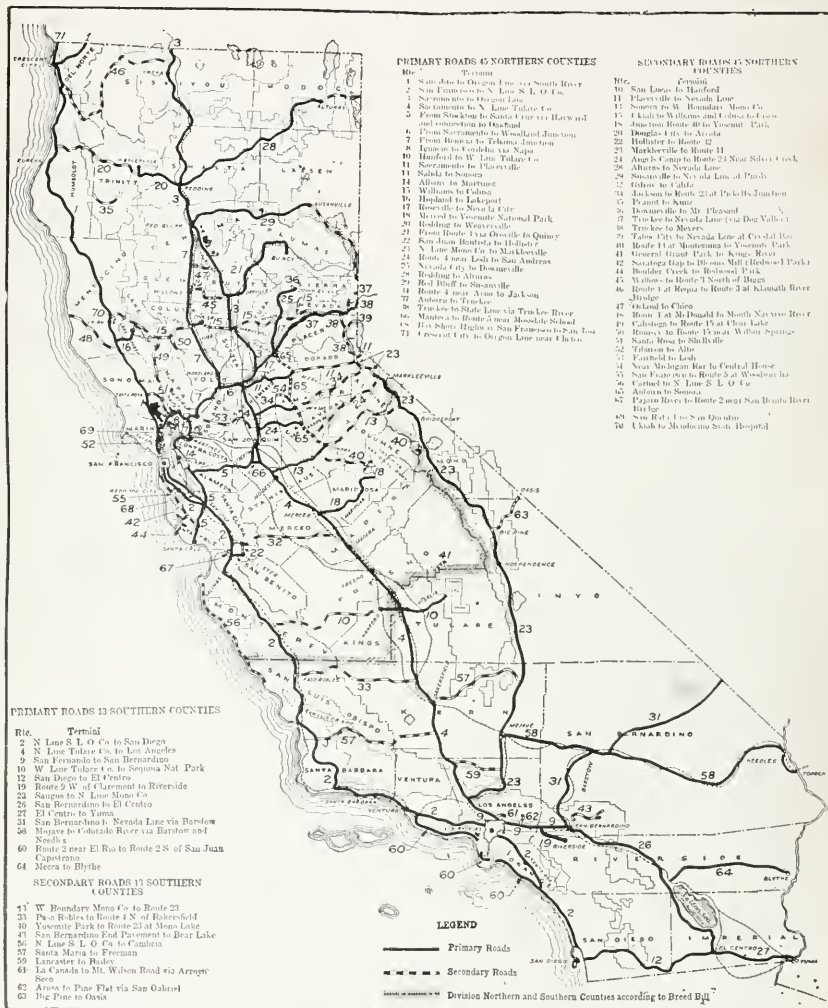
DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor

Port of San Jose—Not appointed

Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



CALIFORNIA HIGHWAYS and PUBLIC WORKS



Official Journal of the Department of Public Works
FEBRUARY State of California 1930



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Investigating the Water Resources of Southern California Counties

THE Water Resources Investigation now in progress throughout California constitutes the most extensive water survey and study ever attempted in the United States. Southern California water studies constitute a major part of this important investigation.

The area south of the Tehachapi contains over half the population and one-fifth of the agricultural lands in the state, but only one per cent of the total water supply (exclusive of the Colorado). The value of water in the cities and highly developed citrus lands of the south is much greater than in other parts of California and has made it possible to pump from wells with lifts as great as 400 or even 600 feet. Nearly all of the natural water supplies in southern California have been used up and there is an immediate and pressing necessity for more water which can only be secured from the Colorado. However, there still remains in some streams water which has not yet been put to use.

On account of the extreme scarcity and great value of water in the south a large amount of engineering investigation has been carried on by the state and local interests for many years. However, accurate and continuous measurements of stream flow, water supply from rainfall, waste into the ocean, have not been available, the reason being that the physical conditions make such accurate measurements extremely difficult and expensive to obtain.

PROBLEMS PECULIAR TO SOUTH

Geological and topographical conditions in southern California are different from those in the north. The stream flows are very erratic, and large and destructive floods occur, followed by seasons of almost no run-off. The stream channels in the mountains are very steep, which results in there being few reservoir sites of value. On the other hand, the great floods flowing down the steep channels have carried out tremendous quantities of gravel and sand and have built up porous detrital cones which afford underground storage reservoirs. The existence of these under-

ground reservoirs has made possible the agricultural developments of southern California, which would have been limited otherwise. For instance, in the Santa Ana Basin the usable underground storage capacity is estimated at a million and a half acre-feet, which is about twenty times as great as the surface storage now in use on this stream. These same conditions obtain generally in southern California with the exception of San Diego County, where there are no underground reservoirs of consequence, but where as in the northern part of the state advantageous surface reservoir sites do exist.

STREAM GAGING OF VITAL IMPORTANCE

These different physical conditions widely change the character of the water resources investigation in southern California from that in the area north of the Tehachapi. As more accurate knowledge of the stream flows is basic information necessary for proper engineering analysis, an intensive stream gaging program, in addition to that which has heretofore been carried on by the federal and state governments was planned and is now in operation as follows:

Santa Maria Valley (Santa Barbara County): Stations have been established on Huasna Creek at mouth; Cuyama River above Huasna Creek; and on the Sisquoc River at its debouchure into valley.

Santa Ynez River (Santa Barbara County): Discharge will be calculated from records at Gibraltar Reservoir of the city of Santa Barbara.

Ventura County: Stations on Santa Clara River, Sespe and Santa Paula creeks, and Ventura River.

Little Rock Creek (Los Angeles County): Data will be secured at the reservoir of the Little Rock-Palmdale Irrigation District for calculation of stream discharge.

San Gabriel (Los Angeles County): A total of 27 stations have been in operation for several years past by the state.

Santa Ana (Orange, Riverside and San Bernardino counties): A total of 58 stations in the watershed.

Mojave River (San Bernardino County): Stations established at the mouths of Deep Creek and West Fork above irrigation and also at Afton below all irrigation.

San Jacinto River (Riverside County): One station near San Jacinto.

Whitewater River (Riverside County): Station at highway crossing at debouchure, and also below Indio. Also a station on Palm Canyon, a tributary of Whitewater River.

San Juan Creek (Orange County): Station at ocean.

Santa Margarita River (Riverside and San Diego

This article constitutes a report made by B. E. Meek, Director of the Department of Public Works, to Governor C. C. Young at the January session of the Governor's Council.

counties): At Nigger Canyon reservoir site and at Temecula Canyon near Fallbrook.

San Luis Rey River (San Diego County): At the mouth and also at Bonsall about 15 miles upstream.

San Dieguito River (San Diego County): Discharge will be calculated from Lake Hodges reservoir records.

Tia Juana River tributaries are to be measured at international boundary as follows: Campo, Tecate and Cottonwood creeks.

SANTA ANA RIVER INVESTIGATIONS IN ORANGE, RIVERSIDE AND SAN BERNARDINO COUNTIES

An intensive investigation along several lines is being made in the Santa Ana River Basin. Conservation in the Upper Santa Ana Basin can be best accomplished by "spreading," which consists of diverting the flood waters, which would otherwise flow to the ocean unused, onto the gravel cones extending into the valley and sinking this flood water into the underground reservoir, from which it is later drawn by pumps. Much work along this line has already been done by the Tri-Counties Water Conservation Association, but it is planned to increase the facilities for spreading by means of a permanent weir or dam across the mouth of the canyon and larger spreading works. The state is making a detailed survey of the Santa Ana Cone, and the topographical survey of possible diversion works at the mouth of the canyon is almost completed. This is to be used as a basis for preliminary plans for diversion works which will function during high water periods and allow the diversion during floods of 1000 second-feet for spreading which will cause it to percolate into the cone on the north side of Santa Ana River. Diversions of this magnitude under conditions of violent floods found in southern California rivers are unprecedented and the problem presents many new and extremely difficult features.

AERIAL SURVEYS; OTHER STUDIES

Arrangements have been made for an aerial survey of the entire area in the Cucamonga Plain from San Antonio Creek eastward to Day Creek and from the mountains southward to Foothill Boulevard in the western part of the area and to Base Line road in the eastern part of the area. This will cover the cones of all the streams of any magnitude issuing from San Gabriel Mountains onto the Cucamonga Plain and will provide a basis whereby systematic plans for spreading these waters on the cones can be worked out and also will provide a basis for plan for a channel to carry the surplus waters of extremely excessive floods safely to the Santa Ana River. Recent studies made by the state have indicated that there is a very material accretion

to the groundwater supplies from rainfall on the valley floor itself and from return water from irrigation. Also, there is a considerable loss from evaporation from swamps and waterlogged land. In addition to the stream gaging program mentioned, a comprehensive study is being made of rainfall percolation, evaporation from waterlogged lands and allied subjects. This work is being done in conjunction with the United States Geological Survey and Department of Agriculture; also with the three counties.

MOJAVE RIVER, SAN BERNARDINO COUNTY

A program for a thorough investigation of the Mojave River Basin has been laid out, consisting of stream gaging, measurements of depth to water plane at wells, together with mapping of irrigated and other areas more or less swampy which are dissipating water. The results of this investigation will show what further agricultural development can be made with the water supplies available in the Mojave River.

An aerial survey of the entire valley has been completed which will yield the needed information as to extent of irrigated lands and also areas dissipating water through evaporation. A close estimate showed that this work could be performed more cheaply by aerial survey and a great deal more quickly than by other standard surveying methods.

VENTURA COUNTY

An intensive water resources investigation is being made of the watersheds of Ventura River, Santa Clara River and Calleguas and Conejo creeks, lying southward in the Oxnard section of Ventura County. In short it is an investigation of the entire water resources of Ventura County, looking toward plans for as complete conservation by surface and underground reservoirs as is possible to make together with the determination of the areas in which the water can be best used. Work under way during the month consisted of measuring percolation, determining capacity of underground reservoirs and assembling and analyzing data gathered in the field. Ventura County cooperates in this work.

GENERAL

A general underground water investigation of the entire Pacific slope of southern California is nearly completed. Well records over several years on 968 wells have been obtained by the state itself or furnished from other sources, and all these data are being compiled into a report, which together with maps will be published at an early date.

Battling Snow on State Highways

By T. H. DENNIS, Maintenance Engineer.

THE blanket of snow which covered California's recreational roads, and a portion of the mainline routes, while of immense benefit to the agriculturist and untold delight for the enjoyment of winter sports, presented a real task to the maintenance organization of the State Division of Highways. Most of the maintenance crews in this region were on duty day and night for the entire week ending January 11th. While the average Californian has been enjoying the warmth of his fireside, these men have been out all day and night, battling the icy blasts and snows of winter that the roads might be kept open.

On the Redwood Highway snow fell as far as Eureka to a depth of 6 inches, while on Oregon Mountain east of Patrick's Creek there was a fall of 3 feet. However, travel at all times was able to use this route.

On the Pacific Highway the ground was covered with snow from Orland to the Oregon line, ranging from 20 inches at Redding to some 4 feet near Castella. Rotary and push plows were operated continuously during the period of the storm and a two-way road maintained at all times.

On the Trinity Lateral, between Redding and Arcata, snow was removed from the entire lateral, the snow ranging from 2 feet to 3 feet in depth.

On the Alturas Lateral men labored continuously with truck plows, tractor plows, and graders in removing snow. The snow extended from Redding to the state line, a distance of 180 miles, the depth ranging from 2 to 4½ feet.

On the Red Bluff-Susanville Lateral the snow extended from Red Bluff to the state line, a distance of 179 miles, and some eight crews, equipped with rotary and push plows, disregarding time entirely were able to keep

the road open at all times. The maximum fall was at Fredonia Summit, where a fall of approximately 3½ feet occurred.

Snow was also plowed on the Klamath River Lateral from the mouth of the Shasta to Weitchpec, a distance of 132 miles.

The foothill country east of Sacramento was entirely covered with snow, the snow extending down into the valley. However, all of these foothill roads, including the Mother Lode, were, by continuous effort, maintained at all times open to travel. By reason of these efforts, people were enabled to enjoy snow sports at various points.

Snow was removed on the Tahoe Road as far east as Riverton, 20 miles above Placerville.

On the Auburn road snow was removed from Auburn to a point 21 miles above Colfax, the government airport, which is at an elevation of some 5200 feet. Tractor, push and rotary plows were necessary to provide a continuous two-way opening of this route, the maximum depth of which was 10 inches at Auburn and 4 feet at airport.

Snow fell as far down as Auburn on the Downieville

Lateral, and the strenuous efforts of the highway crew enabled this route to be kept open to Nevada City at all times, and succeeded in opening to Downieville within a week after the peak of the storm. The heaviest fall of snow occurred at the 3500-foot elevation, east of Camptonville, where a fall of 4 feet was removed.

The interstate traffic between the state line and Truckee was uninterrupted, even though the fall averaged in excess of 24 inches between these points, tractor plows and truck plows being operated continuously by our crews. Truck plows, by continuous operation during the past week, were enabled to clear the snow between Sonora and Long

MAINTENANCE FORCES

OFFICIALLY COMMENDED

The work of maintenance forces in battling snow on state highways was recognized in the following vote of the California Highway Commission.

Voted, That the California Highway Commission expresses appreciation of the untiring and able manner with which maintenance forces of the Division of Highways battled with snow on state highways during the storms terminating January 11, 1930.

The Commission feels that the record is one in which the entire people of California can well take pride and is an example of the unselfish devotion to duty which permeates the entire state highway organization.



Motor grader on Victory Highway.

Barn, a distance of some 20 miles, the average depth exceeding 24 inches of snow, with a maximum of 3 feet at Long Barn.

By strenuous efforts and continuous operation a rotary snow plow maintained a two-way road between Murphy's and the Big Trees, where the winter sports were enjoyed by thousands of people over the week end. Traffic on this route was not interrupted at any time.

Truck plows and tractor plows performed their share in the work of keeping the All-Year Highway open into the Yosemite. Some trouble was experienced on January 12th, between 6 a.m. and 10 a.m., due to a 15-inch fall on the Briceburg Hill, but this, too, was



Scene on State Highway during January snow storm.

removed, and travel allowed to complete their journey from the park.

In the southern portion of the state some 70 miles of the Ridge road was blanketed with a cover from one to three feet deep. Some 12 pieces of equipment operated over this stretch, consisting of truck and tractor plows, which later were supplemented with a rotary.

Two-way and one-way travel was allowed over this route, with the exception of the

period between Saturday at 9 a.m. and Sunday at 3 p.m. Considerable trouble was experienced on this route, due to the heavy trucks which attempted the grade without being provided with chains. The storm also caught many of the motorists unprepared, and they were restrained from attempting the trip not being provided with chains.

On the Arrowhead Highway leading eastward across the Desert to the state line some 4 feet of snow fell at Cajon Pass. Some 6 pieces of equipment labored continuously during this period, supplemented by men with shovels, to maintain a continuous one-way road throughout this storm.

Between Beaumont and Banning, at the Desert's edge, east of Redlands, the pavement was covered with some two feet of snow.



Snow plow at work on State Highway in Calaveras County.

However, this at no time interfered with traffic.

East of San Diego on the Border Highway, falls of snow were had near Pine Valley, Buckman Springs, and Boulevard, yet by the efforts of our crews this route was kept open.

All in all, the weatherman has provided an

(Continued on page 25.)



View of snow conditions on Ridge Route on January 12.

Night Patrol Being Organized

By ROY YOUNGBLOOD, Assistant Superintendent, California Highway Patrol.

IF THE scream of a siren on a powerful white ear disturbs your reveries along a quiet road some night soon, don't get excited over it. Pull over to the side of the highway and let the white ear pass for it probably will be only the night patrol chasing another drunken driver or speeder.

It may be some weeks before that happens. It takes time to organize a night patrol

they submit lists of candidates from which additional appointments to the regular force could be made, in compliance with the law. In all, 122 additional men were requested it being contemplated to use this number of men at the beginning for night duty.

Although the average number of men requested in each county was two, some counties will need as high as four.

To date practically all the supervisors have responded and have submitted their lists. It now remains for these appointments to be made after the manner set up by civil service regulations.

After the men have been appointed a considerable period of training will be necessary before they will be permitted to go out on night patrol duty. This type of work is very different from day patrol duty and will require a special type of training.

We also have taken steps to provide the men with inexpensive but substantial automobiles. Motoreycles will not be used to any extent for night duty because of the hazard of operating them at night.

The additional men appointed are to be assigned to the captain of the county from which they were nominated. Whether assignments for permanent duty to the night patrol will be made or whether it will be arranged in shifts so that all members of every squad are assigned to it a portion of each month remains to be worked out.

Both arrangements have their advantages. In nearly every squad there are, unquestionably, men who would prefer night duty the year round and the privilege of using an automobile to day duty on a motoreycle. Indeed, there are some of our men unable to ride a motoreycle because of injuries received in the service. To such the night patrol will be a godsend.

As contemplated at this time, the night patrolmen in each county will work under instructions from their county captains. However, we are working on plans for providing some sort of central supervision for these men inasmuch as it obviously is impossible to expect the regular captain to work day and night or to have a day captain and a night captain in all the counties.

It may be possible to work out this problem



ROY YOUNGBLOOD.

just as it has taken time to get the regular patrol in working order. But happen it will for California highways are going to be protected against the reckless and criminal driver by night as well as by day.

Section 30-1 of the motor vehicle act states that "the chief of the division (meaning the Division of Motor Vehicles) shall make adequate provision for the patrol of the highways both day and night."

The executives of the California Highway Patrol regard this as a mandate of the legislature as, indeed, it was intended to be when put into the act, and have taken steps to organize patrol to the end that a part of every county unit shall be on night patrol duty all the time.

Some weeks ago, requests were sent to the supervisors of forty-five counties asking that

with the district inspectors in some way to provide night supervision.

The men will work in pairs, never alone. Experience has taught us this is the safest plan. On night patrol the officers are likely to encounter the most hardened type of criminals who would not hesitate even at murder to carry out their evil intentions. Sawed-off shotguns and possibly tear bombs will be a part of the equipment of every car operated at night. The patrol must be prepared for every emergency.

While the men will be instructed to enforce every part of the Motor Vehicle Act and to arrest persons violating any of its provisions, we intend to give them specific training along certain lines to catch the type of offender operating at night.

Most important, perhaps, is the crying need for abatement of the headlight evil. We have conducted statewide raids at various times against glaring lights but this gives us only temporary relief. The night patrol will be instructed to pay particular attention to this type of offender.

Traffic counts made all over the state have developed the fact that the highways are used at night by large numbers of trucks engaged in commercial transportation.

Night patrolmen will be instructed to keep an eye out for the overloaded truck. And, of course, special training in the technical aspects of the law governing overloading will be needed before the officer can be sure when he is right and when he is wrong.

The schools for the officers we are arranging to establish will solve the problem of fitting the men for the special task of night patrol work. General J. J. Borree, head of the schools and education bureau, has just returned from the east where he was sent to make a special study of traffic officers' training schools. The information he secured will be turned to good account in the special training.

As stated before, it is our hope that the night patrol will serve in a large measure to reduce the toll of death and injury on the highways. While the volume of accidents occur in the late afternoon when traffic is at its peak, the accidents involving the greatest number of fatalities occur at night. The drunken driver is a heavy contributor to this toll and we are going to make a special effort to get him. In general we have found that cars involved in accidents at night are cars traveling at excessive rates of speed. Naturally when an accident occurs under such conditions it means a bad smashup and a death.

Governor Inducts Highway Patrol Into New Duties

The California Highway Patrol was officially inaugurated in ceremonies held in Los Angeles January 29th and at Sacramento February 4th at which Governor C. C. Young reviewed members of the patrol of the southern and northern counties.

The Los Angeles ceremonies were held on the north side of the Coliseum grounds. Approximately 100 officers in their new two-tone uniforms and equipped with new white motorcycles were drawn up for review. Governor Young passed along the line shaking hands with each man. Accompanying him were Bert B. Meek, Director of Public Works, Eugene W. Biscailuz, superintendent of the patrol, Mayor Porter of Los Angeles, Sheriff Traeger, Chief of Police Steelkel and others.

Governor Young made a short address, congratulating the men on their appearance. He declared the primary object of the patrol was not to make arrests but to protect the motorists on the highways and to assist traffic.

More than a score of photographers and talking picture cameramen were on hand to record the ceremonies.

A spectacular parade preceded the ceremonies.

The scene was reenacted in Sacramento on February 4th when approximately 50 officers and executives lined up for review in the square between the two Capitol extension buildings.

Governor Young expressed the hope at the Sacramento ceremony that the inauguration of the new patrol would do much to reduce the toll of accidents on the highways. Biscailuz pledged the efforts of himself and the patrol in making this possible.

VIEWS ON OPPOSITE PAGE

Upper pictures—Motor cars and traffic officers on inspection in Sacramento; Governor C. C. Young extending congratulations to Ed Schmidt; B. B. Meek, Director of the Department of Public Works at left of Governor Young; Left center—Southern traffic officers on review in Los Angeles with Eugene W. Biscailuz, Superintendent of the California Highway Patrol, and Roy R. Youngblood, Assistant Superintendent, standing in front of the line to the right; northern traffic officers on inspection before the State Office Building in Sacramento; the two lower pictures show southern traffic officers on parade in Los Angeles, with Governor Young, Superintendent Biscailuz and Assistant Superintendent Youngblood inspecting the squad.

Hail the New State Highway Patrol!



State Safeguards its Construction By Thorough Supervision in Field

By J. W. DUTTON, General Superintendent, Division of Architecture.

THE evolution of a construction project is very often quite interesting. The man with the money finds himself in need of a building. He looks about for his architect and when he finds one to his liking, he lays his desires before him, giving him all the information he can think of, how much he expects to spend, what sort of a building he

agreed upon, the responsibility of the architect continues throughout the entire progress of the work and on to its satisfactory completion.

STATE PROCEDURE SIMILAR

With the State Department of Public Works, Division of Architecture, the general scheme is very much the same. Instead, however, of the business being arranged by a private owner and a private architect, it is done on the one side by the State Architect and his designing force and estimators, and on the other side by the executive head of the institution, under the guidance and direction of the head of the department under which the particular institution comes, such as the Department of Institutions, Department of Education, or the State Board of Prison Directors.

In many cases, due to the similarity of requirements and the general trend toward standardization of buildings for similar purposes throughout the typical institutions, and the accurate cost data which are kept on all of the construction carried on by the Division of Architecture, and the familiarity of all parties concerned with the latest approved plan layouts, etc., the preliminary arrangements can be decided upon without undue loss of time. However, occasionally a project comes up calling for design of a building for some exceptionally special function on which the division has no first-hand information available. Considerable research is obviously then required in order that no detail neces-



J. W. DUTTON.

wants, the type of architecture he favors, and the type of construction he thinks is best for the use he proposes to give it. The architect then proceeds to design the building and after various degrees of modification or elaboration he is successful in selling the owner a design which it is shown by the estimate can be built within the funds available.

This being settled upon and approved, the architect gets out complete working drawings and specifications and the job is put out for bids and finally a contract is let for its construction.

Then follows usually the selection of a satisfactory superintendent of construction to represent the architect and owner and the work goes merrily forward. Unless otherwise



The new cell block at Folsom.

sary to the successful and practical use of the building is omitted.

FROM OFFICE TO THE FIELD

Very naturally, when a set of finished drawings is gotten out for a job, comprising complete architectural and engineering drawings and details, including mechanical and electrical layouts and details, and the specification writer has completed his work, the office force, particularly those in charge of the various sections, is pretty thoroughly familiar with the project.

The job then goes out for bids and contract. It is then that the field force gets its first look at what has taken months possibly to devise. Within a few short weeks at most, the job is started and the field superintendent

construction by the field force. On account of the often remote locality of the work there is difficulty in obtaining a detailed explanation of the scheme from the designer and it is possible that the job superintendent does not grasp the entire import of the matter and later finds that adequate provision has not been made in earlier work to make the best installation possible.

It is fully realized that there must be a limit to what is shown and detailed in a set of drawings and called for in the specifications and a lot must be left to the intelligence and experience of the field superintendent but it is a wonderful help to him and an invaluable guide against error if his attention is called to the exceptional by a brief note on the drawing.



Plant quarantine inspection station being planned by the Division of Architecture for the Department of Agriculture.

is expected to have acquired a pretty thorough knowledge of what is on those plans and in the specifications and be able to protect the state against errors or omissions such as are so easily possible during the progress of a job.

Thus, attached to the field force of any construction organization, there is a degree of importance and responsibility which is not always fully realized or appreciated.

In some minor cases, where the work is regular in character, the field superintendent needs no particular assistance from the office in addition to the plans and specification in order to carry out the job as called for, but in the case of major construction, there are peculiarities of requirement and design attached to practically every project turned out that call for unusual application of known principles and methods of construction. Quite often the actual success of the detail from the builder's standpoint, calls for further study and preparation or arrangement of earlier

DRAWINGS ARE EXPLICIT

It is conceded by contractors generally that there is very little to guess at on drawings gotten out by the Division of Architecture and it is not often that a difference of interpretation arises between the superintendent and contractor. This happy situation can only be brought about and maintained by advance knowledge and conclusion as to what is called for, and proper directions given before errors are made.

Where a field superintendent is already on the ground, in connection with other work, he is supplied with drawings and specifications of the forthcoming new project as early as possible before the contractor arrives to start the work. The field superintendent is instructed to apply any spare time he may have to a detailed study of these drawings and to make notes of any and all points on which he is not fully clear so that these may be explained to him in ample time. After the con-

Machine Finishing for Hot-Mixed Highway Pavement in California

By C. S. POPE, Chief Construction Engineer, California Division of Highways.*

THIS paper relates to the use of mechanical means for spreading, raking, and finishing hot asphaltic mixture for highway and street paving.

The information presented herewith was obtained over a working period of about three years, during the construction of some 250 miles of asphaltic concrete surfaced highways and thousands of square yards of city streets.

The purpose of this paper is not to provide a comparison between the asphaltic type of pavement and any other type, but rather to describe an important advance in improved structure in the asphaltic type and a more economical construction which has been made possible by the introduction of machine finish.

CONCLUSIONS

The advantages which have become apparent and the improvement in asphaltic construction which have followed upon the introduction of mechanical spreading and finishing have been summarized as follows:

(1) Removal of limitations on plant capacity, due to former inability to handle large tonnages on narrow highways.

(2) Decrease in unit costs of asphaltic mixture, due to quantity production and quantity handling on the street.

(3) Greater uniformity of structure of the asphaltic paving base and surface.

(4) Decrease in surface roughness to a point where there is now little difference between the best laid asphaltic type and any other type of pavement in this respect.

(5) Production of a uniformly smooth non-skid surface which will be safe in any weather for a number of years.

(6) Elimination of poor workmanship through the substitution of machinery for hand labor on all of the more important phases of the work.

(7) Reduction in rolling due to the particular arrangement of the paving mixture previous to rolling.

(8) Decrease in plant and street costs due to mass production and decrease in general

contract costs due to speed of operations as a whole.

HISTORY

In this mechanical age, it may seem strange to you as it does to me that contractors were so many years in adopting the use of power operated spreading and raking machines for asphaltic concrete. Similar machines were readily accepted for producing smooth, well compacted concrete pavement, but the practical asphalt paving man always visualized innumerable difficulties which would assail him if he attempted to use similar machines on his work.

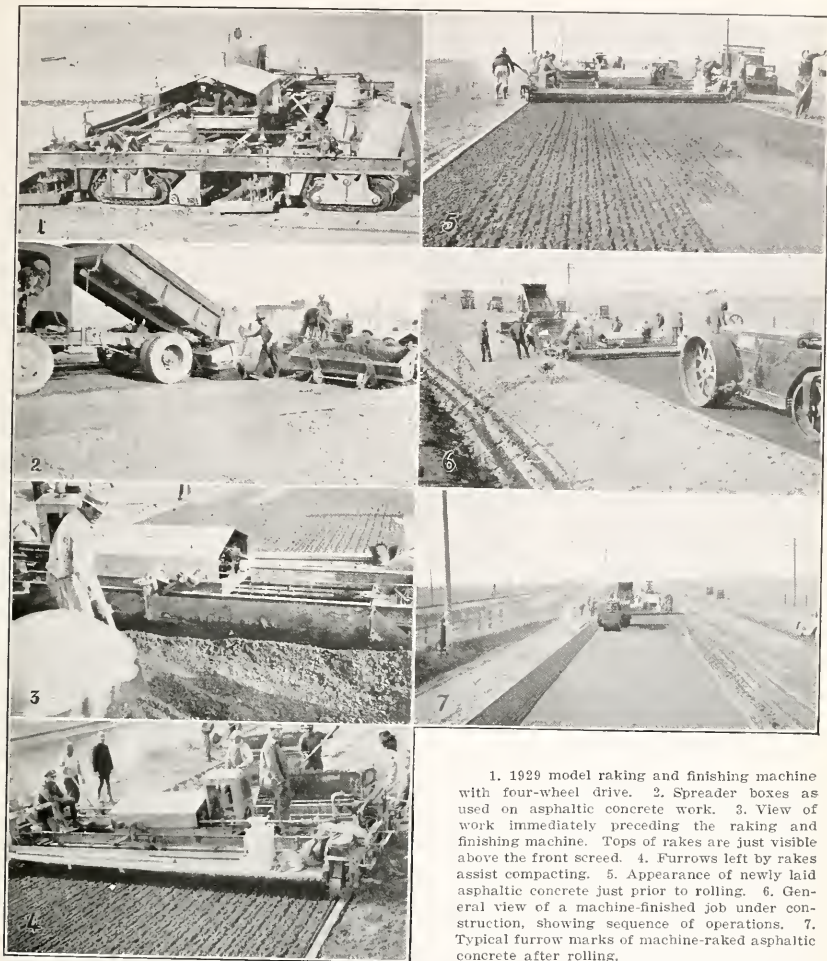
Proposals that it was feasible to spread and rake asphaltic mixtures with machines were met with many objections, since proved unsound. These objections impeded the general adoption of mechanical spreading for two or three years in California at least, after it was first suggested.

During 1924 or 1925, spreader boxes for spreading macadam rock came into general use and their success gave rise to our opinion that these boxes might be used to spread asphaltic concrete base, if contractors could be induced to try them. Their use on the first job on which they were tried allowed the contractor to take off a number of shovelers, so he was entirely agreeable to the next experiment which was to attach rakes to the spreader boxes to rake out the mix. This improvement allowed the contractor to take off one or two more men and convinced us that asphalt concrete could probably be raked and spread by machine methods.

Our spreader boxes were not so economical on the thin $1\frac{1}{2}$ -inch surfaces we were then laying in 1926, so we investigated the use of a large drag rake spanning the entire 20-foot width of roadway to be followed by a strike-off screed. These implements were at first drawn by hand and later by horse power. Both implements operated successfully and gave us a surface smoothness superior to anything we had been able to obtain by hand raking methods, but did not tend to increase plant output.

Through the cooperation of one of the larger road machinery manufacturers, we

* This paper was delivered before the annual convention of the Asphalt Associations, held at West Baden, Indiana.



1. 1929 model raking and finishing machine with four-wheel drive. 2. Spreader boxes as used on asphaltic concrete work. 3. View of work immediately preceding the raking and finishing machine. Tops of rakes are just visible above the front screed. 4. Furrows left by rakes assist compacting. 5. Appearance of newly laid asphaltic concrete just prior to rolling. 6. General view of a machine-finished job under construction, showing sequence of operations. 7. Typical furrow marks of machine-raked asphaltic concrete after rolling.

secured a standard concrete finishing machine and proceeded to remodel it at our own expense and thus completed the first attachments for raking and finishing asphalt concrete by mechanical means.

This machine was furnished on trial by the state to one of our contractors engaged in resurfacing a 10-mile section of highway. The working out of the usual defects which seem inherent in a new machine caused us all more or less concern but in the end the machine got down to work and turned out an excellent job

which showed a roughness of about half of what we had been getting by hand raking. The successful use of this machine was followed very shortly by a decrease in our costs of asphalt concrete paving. So much for the early history of the development of the raking and finishing machines.

OBJECTS SOUGHT

The earlier purposes sought in the use of machines for raking and finishing asphaltic concrete pavement were several.

It was desirable to increase the amount of material which could be handled on the road beyond what was possible by hand spreading. Plant capacity could be increased by building larger plants and hauling equipment could be handled on the road, but because of the nature of the material it did not seem possible to place enough shovels and rakers on a 20-foot road to handle the greatly increased tonnage required for economical work. In other words, the spreading and raking operations constituted the bottle neck of the job.

It was desirable that smoother pavements be laid because of the unfavorable comparison which constantly arose between Portland cement concrete pavements smoothly finished by machine methods and asphaltic pavements still finished by hand raking.

It was desirable that a nonskid surface be constructed which, while smooth, would still afford as safe driving in rainy weather as was claimed for the Portland cement concrete.

It was desirable to incorporate in the pavement construction such qualities as would insure a long life and freedom from objectionable waviness.

A considerable mileage of thin Portland cement concrete pavement, usually 15 feet wide and 4 inches in thickness, was constructed on the California highway system between 1912 and 1922. An unusual feature of this pavement was its high crown which averaged about $2\frac{3}{4}$ inches or about 3 per cent of the half width. This high crown eventually added about one inch additional average thickness for leveling course over the 15-foot width.

Due to the enormous increase in traffic, to faulty foundations, to under-design of the slab and other causes, a considerable mileage of this pavement began to show distress as early as 1916 or 1917 and the state has launched a program of reconstruction or surfacing these pavements to a width of 20 feet.

Highways in especially bad condition or which are subjected to truck traffic or to unfavorable climatic or topographic conditions are resurfaced with Portland cement concrete, while those in better condition or which are located in the valleys or other more favorable locations are surfaced with asphaltic concrete.

The asphaltic concrete type of asphaltic pavement has been chosen generally in California because of its economy combined with a durability equal to any other asphaltic type, and also from the fact that it presents a nonskid surface for a longer time than other plant-mixed asphaltic surface.

PREPARATION

In modern resurfacing operations because of the greatly increased output, great care is necessary in planning to insure smooth coordination between the plant, the hauling equipment, and the spreading and rolling operations.

PLANT

I will refer briefly to certain plant arrangements which have a bearing on our practice. A plant of considerable capacity is desirable, and common practice in California at the present time has fixed on plants producing from 2500 to 5000 pounds per batch as the economical size. Such a plant will turn out up to 65 batches per hour, if properly arranged and average outputs of from 500 to 800 tons per day are not unusual. While our specifications limit output to 65 batches per hour, the number may be increased should our laboratory and field investigations indicate that improved methods introduced by the contractor will produce a satisfactory mix in a shorter mixing cycle.

We have found it desirable to premix all of our aggregate before it is passed to the proportioning bins and this is accomplished either by mixing in layers at stockpiles or else by means of chutes which deposit layers of coarse and fine aggregate on a belt running under the storage bins and which feed the dryer. Weigh boxes are always placed with their outlets at right angles to the mixing shafts of the pug mill instead of parallel with the shafts, since the latter arrangement has a tendency to defeat complete mixing of the different sizes of aggregate.

HAULING EQUIPMENT

Because of the precarious condition of many of our concrete pavements, it is usually required that all hauling be done with pneumatic-tired trucks.

Since the usual load of mixture varies from 5 to 6 tons, the dual type of tire is in common use.

Trucks are usually fitted with convenient coupling devices placed forward of the middle of the truck for ease in attaching the chains by which the spreader boxes are drawn.

SPREADER BOXES

Two usual types of spreader boxes are in common use one of which is equipped with skids on which it is dragged forward and the other is supported by means of rollers. Both are equipped with more or less satisfactory gates extending the full width of the back to permit spreading the mixture to the proper

Engineers Discuss Maintenance Problems

A CONFERENCE of District Maintenance Engineers and Superintendents was held in Sacramento on January 6th and 7th. This meeting was called by Maintenance Engineer T. H. Dennis, with the thought that it would offer an opportunity for a mutual exchange of ideas to the general benefit of the maintenance program.

Papers were prepared and read, covering the various phases of maintenance work, a general discussion following each paper as presented.

During the first day a number of oil company representatives were present to give the latest data on road oils, to which this day was largely devoted. The second day was devoted entirely to other maintenance problems. The program for the two days was as follows:

January Sixth

Opening Remarks—

Mr. Dennis, Maintenance Engineer.

Bitumuls for Maintenance—

Mr. McKesson, American Bitumuls Co. (Paper presented by Mr. Moskowitz).

Asphaltic Road Oils—

Mr. MacSwain, Gilmore Oil Co.

Asphaltic Road Oils—

Mr. Blood, Standard Oil Co.

Asphaltic Road Oils—

Mr. Borden, Shell Oil Co.

Dust Palliatives, Blanket Patches—

Mr. Vickrey, District Maintenance Engineer, District III.

Oil Macadam Blankets—

Mr. Holbrook, Maintenance Superintendent, District IV.

Asphalt Cutbacks—

Mr. Harris, Union Oil Co.

Oil Macadam Blanket—

Mr. Green, District Maintenance Engineer, District V.

Dust Oiling—

Mr. Fite, District Maintenance Engineer, District IX.



1. J. H. Gates. 2. S. E. Harris. 3. H. H. Summers. 4. W. H. Martin. 5. C. J. Sawyer. 6. A. J. Rivett. 7. G. E. Marshall. 8. R. A. Tremper. 9. E. J. Gribble. 10. G. P. Merrill. 11. L. H. Kahl. 12. C. W. Rust. 13. R. H. Wilson. 14. J. W. Vickrey. 15. E. Evers. 16. P. L. Fite. 17. G. F. Hellesoe. 18. L. H. Taylor. 19. F. E. Quail. 20. W. A. Smith. 21. T. H. Dennis. 22. J. G. Standley. 23. E. R. Green. 24. I. S. Voorhees. 25. R. P. Duffy. 26. C. E. Bovey. 27. E. T. Scott. 28. J. E. Stanton. 29. H. S. Clark (N). 30. R. A. Wilson. 31. L. D. House. 32. A. S. Moore. 33. Thos. Eastman. 34. R. S. Peck. 35. Kenneth Mendenhall. 36. C. A. Leighton. 37. C. A. Miller. 38. Norman Underwood. 39. G. H. Nutting. 40. L. C. Evans. 41. E. L. Stump. 42. J. W. Clark (II). 43. F. C. Macaulay. 44. O. F. Georges. 45. E. D. Willis. 46. C. E. Thompson. 47. R. K. Forrest.

Armor Coat—

Mr. Hellesoe, District Maintenance Engineer, District I.

Armor Coat—

Mr. Bovey, District Maintenance Engineer, District X.

January Seventh

Oiling Shoulders—

Mr. Eastman, Maintenance Superintendent, District VI.

Subdrainage—

Mr. Duffy, District Maintenance Engineer, District IV.

Traffic Striping—

Mr. Voorhees, District Maintenance Engineer, District VII.

Disintegrated Granite Road Mix—

Mr. Stanton, District Maintenance Engineer, District VIII.

Weed Burning—

Mr. Vickrey, District Maintenance Engineer, District III.

The following employees of the Maintenance Department were present:

District I—

G. F. Hellesoe, District Maintenance Engineer.
C. A. Leighton, Maintenance Superintendent.
Norman Underwood, Maintenance Superintendent.
C. A. Miller, Maintenance Superintendent.

District II—

L. H. Taylor, District Maintenance Engineer.
J. W. Clark, Maintenance Superintendent.
L. C. Evans, Maintenance Superintendent.
F. C. Macaulay, Maintenance Superintendent.
G. H. Nutting, Maintenance Superintendent.
E. L. Stump, Maintenance Superintendent.
E. J. Gribble, Maintenance Superintendent.
R. A. Tremper, Maintenance Superintendent.

District III—

J. W. Vickrey, District Maintenance Engineer.
R. H. Wilson, Office Engineer.
C. E. Thompson, Assistant District Maintenance Engineer.
C. W. Rust, Maintenance Superintendent.
R. K. Forrest, Maintenance Superintendent.
O. F. Georges, Maintenance Superintendent.
E. D. Willis, Maintenance Superintendent.

District IV—

R. P. Duffy, District Maintenance Engineer.
R. A. Wilson, Maintenance Superintendent.
W. F. Holbrook, Maintenance Superintendent.
A. S. Moore, Maintenance Superintendent.

District V—

E. R. Green, District Maintenance Engineer.
Roy S. Peck, Maintenance Superintendent.
Kenneth Mendenhall, Maintenance Superintendent.
L. D. House, Maintenance Superintendent.

District VI—

E. Evers, District Maintenance Engineer.
Thos. Eastman, Maintenance Superintendent.

District VII—

I. S. Voorhees, District Maintenance Engineer.
C. J. Sawyer, Maintenance Superintendent.
E. T. Scott, Assistant District Maintenance Engineer.

TWO VIEWS OF SAME HIGHWAY SECTION



Above are two photographs which are typical of recent improvement on part of the Los Angeles-San Bernardino Route, known as the "Foothill Boulevard." The photographs were taken at the same location before and after completion of the contract.

Note particularly that the culvert has been lengthened, the pavement has been widened from 18 to 30 feet in width, the pole lines have been set back, and the earth shoulders have been widened.

District VIII—

J. E. Stanton, District Maintenance Engineer.

District IX—

P. L. Fite, District Maintenance Engineer.

District X—

C. E. Bovey, District Maintenance Engineer.
H. H. Summers, Assistant Engineer.
J. H. Gates, Maintenance Superintendent.
S. E. Harris, Maintenance Superintendent.
G. E. Marshall, Maintenance Superintendent.
A. J. Rivett, Maintenance Superintendent.
Grant P. Merrill, Maintenance Superintendent.
H. S. Clark, Maintenance Superintendent.
W. H. Martin, Maintenance Superintendent.
L. H. Kahl, Maintenance Superintendent.

Headquarters—

T. H. Dennis, Maintenance Engineer.
W. A. Smith, Assistant Maintenance Engineer.
F. E. Quail, Assistant Maintenance Engineer.
J. G. Standley, Office Engineer.

Keep Scenic Highways Scenic

By MRS. CHARLES N. FELTON, Chairman, California Committee for Restriction of Outdoor Advertising.

THERE is something more important for California than the mere building of roads and highways, and that is the preservation of California's scenic beauties. In commercial districts where facilities of travel and the need for rapid transportation are the chief consideration, it can hardly be hoped, even by those who are most enthusiastic over the natural gifts of nature, that the native loveliness of the landscape be kept entirely unscarred, but it can be hoped that greater efforts will be made, wherever possible, in the near future, for the preservation of the scenic wonders which are such an asset to California.

Today California can boast of splendid highways, miles and miles of perfect pavement which traverse the entire length of the state and cross and recross its mountain ranges and broad, fertile valleys. Truly, Californians can be proud of the rapid steps which have been made in the development of routes of communication, but can we all be proud of the unsightly fringes which border our most traveled routes?

Glaring billboards, endless rows of signs, frightfully mixed vivid colors to attract attention; *these* are the scenic wonders of romantic California which visiting travelers can remember!

Each year the State Highway Division spends more and more money in order to open up new and lovely regions for the travelers and pleasure seekers. Mountain ranges and deep canyons, which until a few years ago were accessible only by pack train, can now be reached by the vacationist in his automobile in a few hours. Those who love the natural wildness of the hills and those who love the beauty of vast fields of grain and productive orchards, object to having the scenery ruined by the vast multitude of obstructing signs which dot our roadsides.

Just as the public schools of the state are advocating a broader educational program for the children, a program based on taste and appreciation, so are private individuals and organizations pitching into the task to educate the public to a keener appreciation of our natural wonders.

On September 12, 1929, a group of California men and women organized the California Committee for Restriction of Outdoor

Advertising, the object of the organization being to help preserve the natural loveliness of the California scenery by striving to abolish unsightly signs which mar the majority of our highways. The incentive which is uniting these men and women in their protest has already gained the approval of many well known outdoor organizations of the state, among which are the Mills Club, the Redwood Empire Association, the San Francisco Garden Club, the San Francisco Society of Women Artists, the Sausalito Woman's Club, the Tamalpais Conservation Club, and the Tamalpais Centre Woman's Club.

The objects of the California Committee for Restriction of Outdoor Advertising are as follows:

- To influence public opinion to protest against defacement of the landscape.

- To influence advertisers to see that they are destroying an economic as well as an aesthetic feature of California by advertising on the highways, as this state depends more on her scenery for economic welfare than any other state.

- To work for legislation which will prohibit advertising on rural highways.

The program which has been drawn up is:

- To secure individual members by their endorsement of the pledge and an annual membership fee of one dollar.

- To secure as cooperating members, sympathetic organizations by their endorsement of the pledge and their allowing their names to appear on the back of the C. C. R. O. A. stationery.

- To promote state-wide interest in the objects of the committee.

- To give to the cooperating member in each community a program to be carried out.

The men and women who are thus working for the beautifying of the state feel that it is not fair to those who love the glorious scenery which lies along the Pacific slope from the Mexican line past the summit of Mount Shasta, to allow a comparatively few business concerns to litter hilltops and creek beds, forests and pastures, mountain passes and desert wastes, with their huge, glaring placards which have multiplied to such an extent that they have become a well known foundation for national ridicule. It is felt that the state authorities could help, if when lovely sections of the mountains are opened to automobile travel, steps were taken to check roadside advertising. California is growing at such a rapid rate that unless open war is

(Continued on page 27.)

Traffic Control Posi-
tion Supported



Railroad Signboards
to be Removed



A Letter that Tells
Its Own Story

Clippings, Letters and Comment



Dealing With State Highways

Drunken Drivers
Have Licenses
Revoked



Information Wins
Appreciative Letter



Says Stripe Adds
Two Feet to Road

Support for the position of B. B. Meek, Director of the State Department of Public Works that the through street as a means of traffic control presents difficulties not generally understood, comes in a letter to Director Meek from the National Safety Council with headquarters at Chicago.

Commenting on Mr. Meek's statement as published in the newspapers, the letter states that the National Safety Council has completed a "very careful study of accidents on through streets" and that its conclusions are much the same as those of Mr. Meek's, namely that "through streets are an overworked means of traffic control."

"We feel that through streets have a very general place in general scheme," the letter continues, "but especially where they are right of way highways, they may be a menace rather than a safeguard to the driving public."

Among other conclusions cited in the letter is the following:

"When properly established a through street will reduce collisions between automobiles, but pedestrian accidents often increase and the net result is ordinarily no material reduction in the number of persons killed and injured on the through street."

"Traffic on through streets can move more rapidly than that on unprotected streets without being granted special right of way privileges. After making a full stop, a vehicle on the cross street should be authorized to enter under the usual right of way rules."

"Too many through streets defeat their own purpose. Requiring the driving public to stop too often tends to belittle the importance of through-street stops, and makes enforcement difficult, if not impossible."

Railroad Signboards To Be Removed.

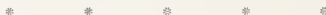
Newspapers in Marin County published the following article during January:

One more forward step in its campaign for the beautification of the Redwood Empire Highway System was taken Monday when, at a meeting of the

executive board of the Redwood Empire Association, E. H. Maggard, president of the Northwestern Pacific, and vice president of the Southern Pacific-Golden Gate Ferries, Ltd., agreed upon the removal of signboards erected by those two concerns in the empire district.

The agreement to remove the signs, according to Maggard, was made in order to comply with the wishes of the people the rail and ferry companies serve, as expressed through the Redwood Empire Association.

All signs will be taken down immediately with the exception of a few directional boards, which Maggard said do not detract from scenic attractions and are not to be classed as traffic hazards.



This Letter Speaks Volume in Itself.

The following letter tells its own story:

Santa Monica, Cal.,
January 16, 1930.

California Highway Commission,
Sacramento, California.

Gentlemen:

With the conclusion today of nine days of continuous stormy, rainy weather in southern California I wish to take this opportunity to commend in the highest terms the work your representatives in this section have done.

No finer devotion to duty nor exhibition of capability has come to my attention than the efficiency of Mr. Jim Stauff, superintendent of maintenance in the Coast Highway division immediately northwest of Santa Monica.

During stormy weather this particular stretch of highway along the Malibu coast is undoubtedly the most difficult to maintain in passable condition of any major state road on your maps. Boulders by the thousands, rock, shale and mud slides, storm waters and a raging sea are the things with which this division has to contend.

Stauff and his crew met the emergency by working ceaselessly early and late to keep the highway clear. Our school buses at 6:30 a.m. found a clear road every day and the passenger buses at night had an equally passable right of way. And this has been true for 5 years.

We have found the Highway Department here to be most courteous and ready to cooperate at all times, including several favors from Mr. S. V. Cortelyou. I feel the least that can be done to express the obliga-

tion I owe your department is to express my thanks in this manner.

Whatever advancement may come to Mr. Stauff in the future I am sure will find him capable of meeting the situation as he has this and many other stormy weather emergencies.

Yours truly,

FRANCIS BRUNNER, Pres.
Santa Monica Mountain Coach Lines.

* * * * *

Property Owners

Have Final "Say-so."

Owners of private property have the absolute "say-so" as to whether posters or unsightly advertising signs or structures are to be placed upon their land. Laws now on the California statute books not only prohibit placing of such signs on state property, which includes state highway right of ways, but provides for the possible removal of signs from private property.

The law is based on the fundamental invested right of property, points out the Automobile Club of Southern California, which broadcasts the state ruling which "prohibits the placing or maintaining of signs, mechanical devices, transparencies, pictures or advertisements upon property of any person or private corporation WITHOUT CONSENT IN WRITING THEREFORE HAVING BEEN FIRST OBTAINED."

* * * * *

Drunken Drivers Have Licenses Revoked.

Warfare waged against the drunken driver continuously during 1929 by state traffic officers resulted in the revocation of the driving licenses of 708 persons for periods of one year or more.

This was announced by officials of the California Highway Patrol who said drunken driving exceeded all other causes of revocation, being responsible for nearly two-thirds of all revocations for the year.

The records show 1162 persons in all were given official invitations to put their cars away for a year and try walking for a change.

* * * * *

Information Wins

Appreciative Letter.

The following letter was received by State Highway Engineer, C. H. Purcell, from H. J. Whitley of Los Angeles:

Paso Robles, Cal.,
January 6, 1930.

It was very kind and thoughtful of you to advise me through your secretary, Mr. Cook, of the advertis-

ing of the "gap" in the paving of the highway to the valley, and I want you to know that I appreciate it.

This action on your part, it seems to me, is quite typical of the thoughtful consideration of the public and the thorough capability shown by every member of the highway organization with whom I have come in contact, from commissioners down to maintenance men.

The early completion of this work, in my opinion, should be of great benefit to this entire community and to the portion of the San Joaquin Valley served by this road.

* * * * *

A Little Late, But Still Welcome.

Here is a belated clipping that should have been reprinted in last month's issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS. It is taken from the columns of the *Petaluma Argus-Courier*:

A beautifully illuminated living Christmas tree in the yards of the maintenance and equipment department of the California Highway Commission on the Redwood Highway, below this city, is the center of attraction.

The tree, twenty-five feet in height, is covered with thirty lights, automatically controlled, which burn each evening from 5 to 10 o'clock.

The tree was placed in position by the maintenance and equipment employees of the commission in this district.

* * * * *

Says Stripe Adds Two Feet to Road.

George W. Ashley writes as follows relative to a road improvement on Cherokee Lane in San Joaquin County:

Greetings, and I wish to remark on the aid to driving the white stripe down the center of the state highway (Cherokee Lane) gives one. I think 90 per cent of the drivers respect it and it seems to have widened that road a couple of feet. I had a chance to specially notice this when driving to the south of Stockton in the rain to attend a public meeting the other night. Cherokee Lane pavement seemed wider than the new highway south of Stockton.

* * * * *

Scatter Salt To Fight Snow.

The following news article emanated from Redding:

Five thousand pounds of salt for distribution on the highway up the canyon was purchased by the State Highway Commission from the McCormick-Saeltzer Company yesterday. The salt was hauled away in one of the Commission's big trucks equipped with a snow plow.

The salt is scattered on icy turns on the highway, resulting in a loosening of the snow and ice for easy removal from the roadway.

OHIO—With a total of 6660 miles of hard-surfaced and 3837 miles of gravel roads, the state added 300 miles to each of these systems in 1929.

1929 Registration of Motor Vehicles

Announced by Class and Counties

The Division of Motor Vehicles, Department of Public Works, has announced the total fee paid registration of motor vehicles by counties, for the period January 1, 1929, to December 31, 1929, as follows:

Counties	Autos	Solid trucks	Pneu. trucks	Motor-cycles	Solid Trailers	Pneu. Trailers
Alameda	135,892	1,590	3,503	847	418	1,172
Alpine	71	1	1	1	---	1
Amador	2,256	35	93	4	2	30
Butte	13,577	85	155	60	87	583
Calaveras	2,351	25	93	6	4	52
Colusa	4,226	31	161	5	40	187
Contra Costa	23,289	244	702	190	66	300
Del Norte	1,690	22	90	7	9	41
El Dorado	2,802	31	152	9	5	32
Fresno	53,521	643	2,379	289	589	3,159
Glenn	4,896	36	173	13	94	468
Humboldt	14,275	105	516	52	25	147
Imperial	21,495	107	1,243	73	78	443
Inyo	2,764	17	122	4	4	35
Kern	33,574	328	1,302	203	327	1,368
Kings	8,908	70	390	31	226	745
Lake	3,053	37	138	9	3	41
Lassen	4,152	14	158	16	7	79
Los Angeles	776,677	7,825	25,631	3,130	3,778	6,579
Madera	5,632	37	256	37	36	372
Marin	10,439	146	306	73	6	52
Mariposa	1,181	13	55	5	3	24
Mendocino	7,225	53	383	23	10	76
Merced	12,974	64	523	83	88	810
Modoc	2,637	15	114	3	2	39
Mono	414	2	32	---	---	2
Monterey	17,502	175	856	117	97	457
Napa	7,475	124	322	64	40	88
Nevada	3,153	23	152	13	6	23
Orange	45,810	295	1,810	206	768	942
Placer	8,652	54	330	36	13	136
Plumas	2,232	38	106	7	5	19
Riverside	28,833	157	1,086	147	336	921
Sacramento	43,832	467	1,846	220	184	842
San Benito	4,402	55	160	38	42	110
San Bernardino	44,509	227	1,826	184	337	837
San Diego	72,913	435	2,251	656	155	675
San Francisco	143,430	3,791	6,282	1,016	363	413
San Joaquin	36,049	417	1,456	229	324	1,493
San Luis Obispo	11,235	82	467	72	41	258
San Mateo	22,563	358	711	141	80	213
Santa Barbara	23,472	136	1,073	158	97	255
Santa Clara	52,285	616	1,719	315	571	1,149
Santa Cruz	13,928	145	638	120	53	245
Shasta	4,830	74	201	22	15	158
Sierra	783	4	29	1	---	3
Siskiyou	8,379	51	341	34	10	126
Solano	12,707	103	382	81	59	250
Sonoma	24,704	301	1,147	142	58	286
Stanislaus	23,465	130	1,091	123	268	1,598
Sutter	5,731	88	165	19	28	186
Tehama	5,250	25	140	16	33	352
Trinity	660	8	33	1	---	4
Tulare	29,070	242	1,316	135	406	2,325
Tuolumne	3,155	23	117	11	5	42
Ventura	20,626	160	917	66	242	563
Yolo	8,892	104	391	49	69	317
Yuba	4,900	59	155	16	23	141
Totals	1,885,308	20,543	68,490	9,628	10,635	32,264

Salinity Investi-
gation

Now Asking Per-
mits for Dams

Review of January Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Flood Control and
Reclamation

Irrigation District
Matters
Water Rights

WATER RESOURCES STUDY

A statement of the work being conducted in southern California will be found on page one of this issue.

SALINITY INVESTIGATION

This intensive investigation has been continued during the past month with 26 regular salinity observation stations and 8 drainage stations being maintained.

Additional measurements have also been made to determine the division of stream flow in the Sacramento along the several channels. During this month ten sets of complete stream flow measurements were made including Georgiana Slough, Sacramento River below Georgiana Slough, Steamboat Slough, Sutter Slough and Three-Mile Slough.

Analytical studies are in progress in the office to determine the relation of salinity to the inflow into the delta and to tidal action. The study showing the variation of salinity throughout a complete tidal cycle for various degrees of salinity and for various characters of tide has been completed. A compilation has been made of the combined stream flow into the delta from 1924 to October 1, 1929.

SALT WATER BARRIER

Since the last report the division has received from the State Printing Office and distributed Bulletin 22, "Report on Salt Water Barrier below Confluence of Sacramento and San Joaquin Rivers, California," by Walker R. Young, Engineer, United States Bureau of Reclamation. This investigation was carried on from 1924 to 1928 by the United States Bureau of Reclamation, under contracts executed jointly by the Bureau of Reclamation, the Department of Public Works and the Sacramento Valley Development Association. The bulletin contains 667 pages of text and 131 plates and maps. Nineteen estimates of cost for barrier at several sites are included.

This bulletin is the first to be published and distributed to the public under the Water Resources appropriation made by the 1929 legislature.

The economic and engineering investigation of the salt water barrier outlined in last month's report is being actively pressed.

An agricultural field survey of the areas adjacent to the barrier is under way. Questionnaires have been prepared which will be submitted to the various interests which might be affected by the construction of the barrier. These will cover industrial, reclamation and agricultural developments.

Negotiations have been initiated for the cooperation of this department with the State Highway Commission, Fish and Game Commission, State Board of Health, United States War Department, Bureau of Reclamation, Coast and Geodetic Survey and Geologi-

cal Survey on the several features in which each particular agency is interested.

A research of the historical records on irrigation and reclamation development has been started.

SACRAMENTO VALLEY

Water Supply Estimates—Estimates of seasonal run-off of all streams in the Sacramento Valley for the period 1889 to 1929 have been completed. Averages for the last five, ten, twenty and forty years for each stream and for the entire basin have also been estimated.

Land Classification and Crop Survey—The land classification has been completed on 4,250,000 acres and a crop survey made for the year 1929 for 3,500,000 acres. The map in the office of land classification and the compilation thereof are about one-half completed.

Well Records—Observations have been made on 230 wells distributed geographically in the Sacramento Valley during the past two months. Efforts were made to use as many of the wells measured by Kirk Bryan in 1913 as possible.

SAN JOAQUIN VALLEY

Main Supply Canal Survey—The surveys of the main canal from the Kings River to the Kern River have been continued throughout the month under unfavorable weather conditions. However, a total of 100 miles of line has been located from Kings River to McFarland in Kern County. About 60 miles of this have been mapped in the office. One route of the line from the San Joaquin River to Kings River has been completed and mapping is about one-half completed. A survey has also been initiated for the purpose of locating a canal from the Sacramento River at a point above Courtland along Snodgrass Slough to Mokelumne River and thence to the San Joaquin River.

Well Records—About three-fourths of the records on 3500 wells in the San Joaquin Valley have been transcribed and analysis of these ground water data has been started which required employment of additional men.

Land Classification and Crop Survey—Land classification and the crop survey of the entire valley from Stockton to Bakersfield have been completed in the field. A report on the area south of the San Joaquin River has already been rendered and a supplemental report on the area north of the San Joaquin River will be made within a month. Good progress has been made in the mapping of both the land classification and the crop survey.

SANTA CLARA (SANTA CLARA COUNTY)

Gaging stations have been installed on Los Gatos Creek, Guadalupe Creek, Stevens Creek and Alamos Creek. An engineer and assistant have been retained who are actively engaged in the preliminaries of get-

ting the work started. Construction of additional gaging stations is under way.

NAPA VALLEY (NAPA COUNTY)

The work of measuring water levels has been started for the year and the work of measuring run-off and loss from the valley is actively under way.

SNOW SURVEY (STATE)

All arrangements have been completed for the surveys in each major watershed. The work in the past month has consisted of getting out final instructions and equipment to local observers. Field trips have been made to instruct observers at key stations where monthly surveys will be made and the January surveys have been made on some of the key station courses but complete surveys of the key courses can not be made until the present storms have abated.

In the office, work has continued in preparing maps for office and field use showing all pertinent data relative to the surveys. The data for past snow surveys, stream flow, precipitation, etc., are being compiled, analyzed for normals, etc., for use in connection with the bulletins and forecasts to be published when coming snow survey data are available.

DAMS

The law providing for state supervision of dams sets February 14, 1930, as the date on or before which applications for approval of existing dams shall be filed. Forty-two such applications were received during the month.

The city of Los Angeles has been sending in its applications steadily and its list is nearing completion. The San Jose Water Works has submitted applications for all of its dams. Aside from these two, there have been very few of the larger owners whose application record is nearly complete. Attention is called to the requirement of the law that applications for existing dams should be made by February 14. A great many are not in as yet, and all owners of dams should send their applications in immediately, if not already filed.

Applications for construction or enlargement have been received as follows:

Dam	County	Owner	Estimated cost
Brand Park	Los Angeles	City of Glendale	\$120,000
Hollywood High	Los Angeles	City of Los Angeles	34,000
Evler Dam	Modoc (Enlargement only, to be raised two feet)		

Applications for repairs or alterations as follows:

Dam	County	Owner
Yorba	Orange	Anaheim Union Water Company
Spooner	Lassen	J. J. Fleming & Company

Both the above applications are for minor changes. Plans approved for construction or enlargement:

Dam	County	Owner	Estimated cost
*Hansen	Los Angeles	Los Angeles County Flood Control District	\$1,000,000
Brand Park	Los Angeles	City of Glendale	120,000
**Morena	San Diego	City of San Diego	

* This will be a flood control dam on Tujunga Creek, of the concrete arch type, 150 feet high.

** This is a rock fill dam on Cottonwood Creek, which is to be raised 5 feet, necessitating 11,000 yards of rock fill.

Plans approved for repairs or alterations as follows:

Dam	County	Owner
Lake Hodges	San Diego	City of San Diego
Chatsworth A	Los Angeles	City of Los Angeles
Shaver Lake	Fresno	Southern California Edison Company

Dam	County	Owner
Big Meadows (also known as Almanor)	Plumas	Great Western Power Company
Bear Gulch	San Mateo	Bear Gulch Water Company

Inspection of dams under construction, enlargement or repair:

Twenty-eight dams are under construction, enlargement or repair in the state at the present time, all being regularly inspected by the division. The larger of these are:

Dam	County
Lake Hodges	San Diego
Glendale Park Manor	Los Angeles
Lower San Fernando	Los Angeles
Hansen	Los Angeles
Juncal	Santa Barbara
Shaver Lake	Fresno
Moccasin	Tuolumne
Calaveras	Calaveras
Salt Springs	Calaveras
Chenery	Contra Costa
Big Meadows	Plumas

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento and San Joaquin Drainage District

Sutter By-Pass—Routine maintenance; drainage pumps operated for short periods.

Wadsworth Canal—One dragline excavator engaged in clearing out northerly mile of Wadsworth Canal.

Tisdale By-Pass—During the last high water, on December 17 or 18, a section of the sheet pile wall of timber along the cut in the center of the Tisdale By-Pass washed out. The length of the section is approximately 80 feet, and the levee adjoining was also taken out. Temporary retard work has been done to prevent a further breaking of the wall and washing of the levee until such time as a new section of wall can be driven.

Cooperative Bank Protection—Cooperative bank protection work for Reclamation Districts No. 673 and No. 900 has been completed. The completion of the work for Reclamation District No. 535 will have to wait for a lower river stage.

Retards—On the Feather River at Nicolaus two of the seven tree retards are completed, and preliminary work done for a number of others.

Feather River—At Robinson Bend a dragline excavator is constructing the barrier across Hefner Slough, which work is approximately 75 per cent complete.

Highway Protection—Contract has been awarded to Leonard T. Isham of Rio Vista for the construction of 850 feet of redwood bulkhead in the Sacramento River at Isleton. This work is in cooperation with the Division of Highways. Emergency work has been done in this place to protect the highway. This work consisted of placing brush mattresses to prevent further wash, and a timber bulkhead to hold the fill adjacent to the highway.

Emergency Flood Control and Rectification of Rivers—On Seven Mile Slough, in Reclamation District No. 2067, a section of bank 100 feet long has been protected with quarry rock, in cooperation with that district.

A small job of bank protection work on the Mad River (Humboldt County), on the property of James B. Moore has been completed at a cost of \$400.

Sacramento Flood Control Project—The project construction clearing work in the Sutter and Butte Slough by-passes has been seriously interrupted by the rains. The two camps on the lower Sutter By-pass were discontinued on December 17, and the operations in Butte Slough were also discontinued at the same time. In the last week of December approximately 100 men were returned to work in the Butte Slough By-pass and in one of the lower Sutter By-pass camps, which was opened again for the purpose.

Five contracts are under way for clearing timber in the Feather River channel above Marysville, but not a great deal of work has been accomplished during this period on account of the weather. The work is approximately 25 per cent complete.

A field examination of the situation at Nelson Bend on the Feather River was made with the construction committee of the Flood Control Association, and a meeting of this committee was held in Sacramento on January 16 for discussion of this and other problems.

Russian River Jetty—The placing of the quarry rock along the jetty has been continued with a crew of approximately fourteen men. An average of 42 cars of rock are being placed per day, or about 150 tons. The job is 60 per cent complete.

Mokelumne River Improvement—The work of clearing the channel of the Mokelumne River in collaboration with the county of San Joaquin has been completed at a cost of \$12,500.

Flood Measurements and Gages—During this period there has been much activity in connection with setting staff gages, conditioning the automatic water stage recorder stations, and preparing for making flood measurements.

Complete personnel has been arranged for 12 metering parties, and equipment has been prepared and set aside for each party. Each party chief has been furnished with a schedule giving all the information necessary to carry out the metering work under his charge.

During the minor flood in December, measurements were made as follows: South Fork of American River at Coloma, North Fork of American River at Rattlesnake Bridge, American River at Fair Oaks, Bear River at Wheatland, Sacramento River at I Street Bridge, Tisdale By-pass, and Sacramento River at Verona (U. S. Engineers).

IRRIGATION, WATER STORAGE DISTRICTS

Irrigation Districts—Investigation and report made on progress and status of Vista Irrigation District (San Diego County).

Field investigations and studies were made for report on proposed Dixon Irrigation District (Solano County), comprising 5589 acres.

The users of water under the Sutter-Butte Canal system (Butte and Sutter counties) are dissatisfied with the operations of the company and are considering the formation of one or more irrigation districts. The Canal Company is a public utility with a service area of 140,000 acres in these counties, but actually serves water to less than half this amount of land. Rates have been increased in the past and an application for increase is now before the Railroad Commission. It is proposed to organize either one or several

irrigation districts within this area, the proposed districts being as follows: Feather, Richvale, Rio Seco, and Sutter-Butte. Petitions for organization are being prepared for some of these districts and one, the Rio Seco (Butte County) comprising from 8000 to 10,000 acres, has been filed with the State Engineer. Investigations of the proposed districts are under way.

In 1929 the division issued Bulletin No. 21, containing histories and financial statistics of all irrigation districts in the state. It is intended to keep these data reasonably up to date and available to the public, and for this purpose a questionnaire has been forwarded to all districts requesting information as of January 1, 1930.

Water Storage Districts—A hearing has been set for February 4, at Hanford, at which the State Engineer will consider applications for exclusion of lands from the Tulare Lake Basin Water Storage District (Fresno and Kings counties).

The Kern River Water Storage District (Kern County) was dissolved by court action some months ago. The records of the district contain valuable engineering and other data and it has been arranged that these will be filed in the office of the county clerk at Bakersfield available to the public.

WATER RIGHTS

Application to Appropriate—During the month 18 applications were received; 35 of those pending were approved and 11 canceled.

During the period nine permits were revoked and five licenses issued.

During the year 1929 there was a reduction in the number of pending applications from 589 to 532, which indicates that the office is eliminating much of the "deadwood" which came during the period of activity in recent years.

ADJUDICATIONS

Whitewater River (Riverside County)—Five orders were entered, granting extensions of time to complete incomplete appropriations.

North Cow Creek—Report covering water-master service and investigation during the 1929 season was completed and copies thereof were forwarded to the various attorneys involved in the proceedings.

Shasta River (Siskiyou County)—Three opening briefs and two reply briefs covering issues raised by exceptions to Division's Order of Determination were completed and filed with the Superior Court.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

The number of registrations including both pay and exempt vehicles for 1929 totaled 2,029,879, an increase of $7\frac{1}{2}$ per cent over 1928. This registration was divided as follows:

Pleasure cars and commercial vehicles under 3000 pounds	1,916,379
Trucks	89,033
Motorcycles	10,180
Trailers	14,287
Total	2,029,879

The registration figures are of interest inasmuch as they check closely with the traffic counts conducted by the Division of Highways. These counts show that the volume of traffic on highways has increased at the rate of 9 per cent annually for the past 5 years. If this rate continues to hold until 1940, the Division of Highways will be expected to maintain the roads for twice the present volume.

The large registration, and particularly that of Los Angeles County, has created a problem of handling applicants for licenses to which consideration is being given. The state now has some land which may be available as a site for a Motor Vehicle Building in Los Angeles. This land is so located as to provide ample parking space for cars, and will be constructed to provide protection against inclement weather to applicants.

SUBSTANTIAL SAVING IN REGISTRATION COSTS

It is worthy of note that the registration this year was accomplished in 15 days less time than a year ago, with the same force of employees, and at a substantial saving to the state. The coming legislature should give consideration to a change in the time for license renewals so that mailing of plates could avoid delays consequent upon mail congestion during the holiday season.

SOLID TRUCKS DISAPPEARING

The figures also reveal that solid tired trucks are fast disappearing from the highways of California. During 1928 the registration of solid trucks totaled 36,618, as compared with similar registration of 20,543 in 1929.

CALIFORNIA HIGHWAY PATROL ORGANIZATION

The California Highway Patrol has been very active in organization work since the last report. To date 50 county captains have been formally appointed. The full strength of the patrol's personnel, including inspectors, captains, traffic officers, patrolmen and border checkers, now numbers 321, exclusive of all clerical help. Notifications have been served upon the board of supervisors of the several counties, requesting them to forward the names of men they desire to recommend for appointment.

FINE WORK OF FOG AND SNOW PATROL

During the recent snow storms extending over the state and a period of heavy fogs in the lower San Joaquin Valley, exceptionally fine service was rendered by the Highway Patrol. In the areas where fog was proving unusually hazardous, a special patrol was put into service. Its duty was to inform each individual motorist of the conditions they would encounter in driving through the fog. This patrol was kept on the job for 36 hours, and during this time no accidents were reported. Previous to the installation of this fog patrol, the accident death rate during the period of fog peril had averaged one motorist a day with many injured.

In the heavy snow storms of early January fine service was rendered the motoring public by the Highway Patrol, and particular mention should be made of the service of the Los Angeles Patrol on the Ridge Route and that of San Bernardino County at El Cajon Pass.

IOWA—In hard surface road building Iowa, which now has 1900 miles, heads the list of states in mileage to be constructed—750 miles will be paved each year in 1929-30-31, making a total of 4150 miles.

WORK SECURED BY JANUARY HIGHWAY CONTRACTS

In accordance with the policy of the Department of Public Works to award contracts so advantage can be taken of favorable climatic conditions for construction, the majority of the awards made during January were on southern California highways. The following statement shows the improvements that will be accomplished through January awards:

San Diego-Yuma Highway

A contract was awarded to the R. E. Hazard Contracting Company of San Diego for grading and paving with asphaltic concrete 5 miles of highway in Imperial County between Dixieland and Seely. The pavement will be 20 feet wide on a sand cushion over the existing oiled graveled surface. The construction of wide side ditches and raising the grade of the highway will eliminate flooding of the road from irrigation overflow. The contract price was \$110,436.30.

A second contract on this same route provides for grading and paving with Portland cement concrete, 2.9 miles of highways in Imperial County extending from Meyers Creek bridge to 3 miles west of Coyote Wells. The pavement is to be 20 feet in width and will be placed on the roadbed which was built following the destruction of the old paved road by the flood of December 1926. The present improvement is located high enough on the mountain side to be safe from damage by future storms. The contract was awarded to Basich Brothers Construction Company of Los Angeles. The contract price being \$121,148.90.

Nine miles of this highway between El Centro and Holtville will be graded and paved with Portland cement concrete under a contract awarded to A. M. Peck Company of Los Angeles. The contract price is \$264,955.35.

Cholame Lateral

The Valley Paving & Construction Company of Visalia was awarded a contract to grade and surface with bituminous macadam 15.5 miles of this highway in Kern County. The termini of the contract are the westerly boundary of Kern County and the Junction Pumping Station. This highway connects the Coast Route at Paso Robles with the Golden State or the Valley Route at Formosa. Under this contract the roadbed is widened to 36 feet and surfaced with an adequate pavement which completes the paving of this entire route. It is a long step in bringing to a modern standard of construction, lateral highways connecting main arterials. The contract price was \$264,655.25.

Coast Highway

Will F. Peck Company of Los Angeles was awarded a contract to grade and pave with Portland cement concrete, a section of the Coast Highway in Los Angeles County at Liberty Grade, about 1½ miles in length. The roadbed is to be graded 40 feet wide and the paving is to be 20 feet in width. This project is on the Ventura Boulevard and is located about 5 miles north of Calabasas. The new alignment straightens the present crooked road and gives a much easier grade. It marks the elimination of one of the few remaining "bad spots" along this artery. The contract price is \$69,953.45.

In San Luis Obispo County between Santa Maria River and Los Berros Creek, on the Coast Highway, 7.2 miles will be graded and paved with Portland

cement. This will be possible through a contract awarded to J. P. Knapp of Oakland at a contract price of \$272,648.05. This project is another step in bringing this important artery between Los Angeles and San Francisco to modern high standards. The work consists of widening the present 24-foot roadbed to 36 feet and placing new concrete 20 feet wide over the existing 15-foot pavement.

Also on this same artery in Santa Barbara County between Zaca and Wignore, 4 miles are to be graded 36 feet wide and Portland cement pavement laid 20 feet wide over the existing 15-foot pavement. This improvement also includes several sections of realignment. Contract was awarded to Cornwall Construction Company of Santa Barbara at a contract price of \$153,239.50.

Another contract on the Coast Highway extends from San Francisco Creek to San Antonio avenue in Santa Clara County, a distance of 4.4 miles. It is to be graded and paved with Portland cement concrete and asphaltic concrete. The roadbed is to be graded to a width from 50 to 100 feet and the paving will be from 20 to 40 feet in width. Existing bridges will be widened. By straightening alignment and widening the highway and bridges this contract brings another section of the Coast Highway up to a very high standard of construction. The contract was let to Hanrahan Company of San Francisco for \$264,926.95.

Arroyo Seco Highway

T. M. Morgan Paving Company of Los Angeles was awarded a contract to grade 1.5 miles of this highway in Los Angeles County immediately north of La Canada and to build a reinforced concrete arch bridge across Slide Canyon. The roadbed will be graded to a width of 36 feet. This project is a continuation of the road now under construction from La Canada along the canyon wall of the Arroyo Seco and will add another mile and a half to this scenic drive. The contract price is \$272,790.50.

Riverside Highway

Approaches to the Wineville subway under the tracks of the Union Pacific Railroad on the road between Pomona and Riverside in Riverside County will be graded and paved with Portland cement concrete 30 and 40 feet wide for 0.5 of a mile. This contract was awarded to Matich Brothers of Elsinore for a price of \$42,592.50.

Cuyama Lateral

Contract was awarded to the V. R. Dennis Construction Company of San Diego to grade and surface with oil-treated crushed gravel or stone a section of the Cuyama lateral, 9.7 miles in length between San Emigdio Road and the Main Valley Route. The roadbed is to be 36 feet wide and the surfacing 20 feet in width. This project is on the newly adopted alignment of the Cuyama lateral which extends between Santa Maria on the Coast Highway and the Valley Route south of Bakersfield. The project is designed on a high standard of construction with adequate drainage enabling the road to be kept passable at all times. The contract price is \$126,455.

Bayshore Highway

Following the decision of the State Railroad Commission upholding the California Highway Commission and the Department of Public Works in the contention that there should be no grade crossings on the Bayshore Highway, a contract was immediately awarded for a section of the highway between Redwood City and Steinberger avenue, San Mateo, over which connection can be made with the Peninsula Highway. The contract was awarded to Frederickson

& Watson and Frederickson Brothers of Oakland for \$406,145.20.

The roadbed of this section is to be graded 60 feet wide, and as soon as the roadbed has had time to thoroughly settle it will be followed by a surfacing contract. The roadbed in this contract is to be built up across tide lands by hydraulic fill from nearby sloughs and by material taken from higher ground just south of San Mateo. This contract calls for the removal of three-quarters million cubic yards of material and 320,000 pounds of reinforcing steel.

Golden State or Valley Route

A contract was awarded to the California Construction Company of San Francisco for grading and paving with asphalt concrete 8.6 miles between Pixley and Tipton on the main Valley Route in Tulare County. This improvement consists of widening the existing 20-foot roadbed to 36 feet and placing 20-foot surfacing over the present 15-foot pavement. Contract price is \$240,109.60.

Pacific Highway

Wren and Greenough of Portland, Oregon, were awarded a contract for grading and surfacing with untreated crushed gravel or stone 7 miles between Yreka and the Klamath River in Siskiyou County. This project begins just about 2 miles north of Yreka and consists of grading the roadbed 30 feet wide and placing surfacing 20 feet wide. The new alignment, replacing the old crooked road by skirting the top of Shasta Canyon and crossing intervening divides, shortens this portion of the route. This project adjoins a recently completed section of the Pacific Highway between the Klamath River and the Oregon line. Contract price \$571,626.25.

C. W. Wood of Stockton was awarded a contract for grading and paving with Portland cement concrete 0.7 of a mile of new alignment through the town of Dixon, Solano County, thus eliminating two well known and dangerous grade crossings. The new alignment follows Adams street through Dixon, remaining on the westerly side of the S. P. tracks. Contract price \$27,974.80.

COMPLETION OF CONTRACTS

Coast Route

A contract for constructing the state's share of the grading and Portland cement concrete paving between Santa Ana and Anaheim in Orange County for a distance of 4.9 miles, and at an approximate cost of \$190,000, has been satisfactorily completed and accepted. Griffith Company of Los Angeles was the contractor.

Another contract in Orange County for constructing a graded roadbed and placing Portland cement concrete pavement between Serra and San Juan Capistrano, for a distance of 0.7 of a mile, at an approximate cost of \$36,100, has been accepted. Matich Bros. of Elsinore were the contractors.

In Santa Clara County, contract for constructing the Calabasas Creek channel change near Santa Clara, at an approximate cost of \$6,975, has been satisfactorily completed. N. M. Ball of Porterville was the contractor.

Contract for constructing a graded roadbed and placing Portland cement concrete and asphalt concrete pavement between Sunnyvale and Santa Clara, Santa Clara County, for a distance of 4.5 miles, at an approximate cost of \$220,100, has been completed and accepted. N. M. Ball of Porterville was also contractor on this work.

In San Diego County, a contract for placing bituminous macadam borders and constructing timber curbs between San Diego and Oceanside, for a distance of 3 miles, at an approximate cost of \$36,600 has been satisfactorily completed. R. E. Hazard Contracting Company of San Diego was the contractor.

Markleeville Routes

A contract for producing and placing untreated crushed gravel or stone surfacing between Jackson and Pine Grove, in Amador County, on the Jackson-Markleeville road for a distance of 3.3 miles and at an approximate cost of \$15,600 has been satisfactorily completed and accepted. George French, Jr. of Stockton was the contractor.

In Alpine County a contract for grading and surfacing with untreated crushed gravel or stone at Markleeville on the northern portion of the Bishop-Owens Valley-Los Angeles Route, a distance of but 0.3 of a mile, and at an approximate cost of \$19,200, has been satisfactorily completed and accepted. Camino Construction Company of Palo Alto were the contractors.

Mother Lode Highway

Contract for producing and placing gravel surfacing from a point 2 miles south of Mokelumne Hill, in Calaveras County, for a distance of 2.2 miles at an approximate cost of \$5,100, has been satisfactorily completed and accepted. The Adams Company of Angels Camp were the contractors.

Valley Route

In Sacramento County between Arno and McConnell's Station, on the main Valley Route, distance of 1.2 miles, a contract for grading roadbed and placing untreated crushed gravel or stone surfacing at an approximate cost of \$61,100, has been satisfactorily completed in accordance with plans and specifications. Larsen Brothers of Sonoma were the contractors.

Redwood Highway

Contract for constructing a bituminous and water-bound macadam surfacing between Elk Valley and Smith River in Del Norte County for a distance of 3.8 miles at an approximate cost of \$16,500 has been satisfactorily completed. J. C. Compton of McMinnville, Oregon, was the contractor.

In Marin County a contract for constructing a bridge across Novata Creek at an approximate cost of \$29,758 has been completed and accepted. W. L. Proctor of Santa Rosa was the contractor.

McDonald-to-the-Sea Highway

In Mendocino County, contract for constructing a graded roadbed and placing surfacing, also building timber bridges between McDonald and Navarro, for a distance of 1.6 miles at an approximate cost of \$88,300, has been satisfactorily completed and accepted. W. C. Colley of Berkeley was the contractor.

Pacific Highway

Contract for constructing a graded roadbed and placing asphaltic concrete and Portland cement concrete pavement from Ben Ali to Sylvan School, Sacramento County, for about 8.7 miles, and at an approximate cost of \$347,700, has been satisfactorily completed and accepted. Frederickson & Watson and Frederickson Bros. of Oakland were the contractors.

Timid wife (to husband who has just fallen asleep at the wheel): "I don't mean to dictate to you, George, but isn't that billboard coming at us awfully fast?"

Hoover-Young Water Commission Organizes

THE joint commission appointed by President Hoover and Governor Young to study the water resources of California was organized at a meeting held in San Francisco on January 13th. This meeting was attended by Governor Young, State Engineer Edward Hyatt was appointed secretary. An invitation was extended to the Joint Legislative Committee to attend all the meetings of the committee. Appearance before the committee should be arranged through the secretary.

The membership of the Federal and State California Water Resources Commission as appointed by President Hoover and Governor Young are as follows:

United States members:

F. E. Bonner, Executive Secretary, Federal Power Commission, Washington, D. C. (representing Federal Power Commission).

Elwood Mead, Commissioner of Reclamation, Washington, D. C. (representing United States Interior Department).

Thos. M. Robins, Lieutenant Colonel, Corps of Engineers, United States Army, Division Engineer South Pacific Division (representing United States War Department).

California members:

George C. Pardee, Chairman, formerly Governor of California, President of the Board of Directors of the East Bay Municipal Utility District, and Chairman of the State Board of Forestry; Oakland.

William Durbrow, President of the California Irrigation Districts Association, and Manager Nevada Irrigation District; Grass Valley.

B. A. Echeverry, Professor of Irrigation Engineering, University of California; Berkeley.

Alfred Harrell, Publisher *The Californian* and Director of the State Chamber of Commerce; Bakersfield.

W. B. Mathews, Member of the Colorado River Commission and Chief Counsel for the Los Angeles Department of Water and Power; Los Angeles.

Warren Olney, Formerly Associate Justice of the State Supreme Court; San Francisco.

Frank E. Weymouth, Formerly Chief Engineer of the United States Reclamation Bureau, and Chief Engineer of the Metropolitan Water District of Southern California; Los Angeles.

Ex officio members:

W. J. Carr, Commissioner, State Railroad Commission.

B. B. Meek, Director of the Department of Public Works.

A Chinese truckman in Vancouver sent the following bill to a grocer for delivering orders:

10 goes
10 comes—at 50 cents a went.....\$5 00

BATTLING SNOW ON STATE HIGHWAYS

(Continued from page 4.)

unusual task for the Division of Highways, but their tireless efforts have proved equal to the task. During this period snow has been removed on some 800 miles of road.

The following letters indicate the appreciation of the public for the work done in keeping highways open.

Letter from C. G. Thomson, Superintendent Yosemite National Park:

I have just sent three wires to the News Services complimenting your Mr. Wallace on his fine maintenance of the All-Year Highway to Yosemite during the recent storms.

If the occasion arises, count upon our reciprocating this fine service.

Very truly yours,

C. G. THOMSON,
Superintendent.

Letter from the Automobile Club of Southern California:

January 16, 1930.

Mr. B. B. Meek,
Director of Public Works,
State of California,
Sacramento, California.

My dear Mr. Meek:

We want to tell you how much we appreciate the splendid work of District Engineers, Cortelyou and Sullivan, and their assistants in keeping the mountain roads of southern California passable during the recent storm. Maintenance crews and extra gangs were on the job day and night and in the face of the heaviest snow fall which southern California has experienced in many years kept travel moving with a minimum of inconvenience.

The Highway Commission is to be congratulated upon its efficient organization and I can assure you that its work is appreciated by the motoring public.

With kind personal regards, I beg to remain

Very truly yours,

AUTOMOBILE CLUB OF SOUTHERN
CALIFORNIA.
E. E. EAST, Chief Engineer.

Letter from Ed. Hess of Stockton:

The writer was at Long Barn and Twain-Harte Lodge since January 9th, during the recent storms. While up there, many times I watched the road workers at their work, surely some rather hard work—blizzard and other bad weather and they managed to keep the road plenty clear of snow—several cars wide practically all the way.

I happened to read in a metropolitan newspaper "All points above Sonora reported totally cut off," etc.

After reading this I could not but help thinking of those road men, working as they did, and had the road cleared plenty wide—even working at night in blizzard weather, and then have the newspapers print such untrue reports. Please understand I have no

property interests or business place along that highway, and no one asked me to write this.

About 40 to 60 cars were at Long Barn (20 miles above Sonora) Sunday. I stayed over two days more, and not one car that did not get away Sunday.

Letter from the Colfax Lions Club:

Colfax, California, January 22, 1930.

Mr. C. H. Purcell,
Sacramento, Cal.

Dear Sir:

At the regular weekly noon luncheon of the Colfax Lions Club, held on January 13th, a unanimous vote of thanks and appreciation was given your office for the wonderful work you were doing in keeping the Lincoln Highway, Route 40, open to travel and free from snow as far as the Blue Canyon Airport. There were over 1500 cars on this highway Sunday, January 19th, which traveled up into the snow. This work on your part means a lot to Colfax and the surrounding country as well as to the people who are able to come up and play in the snow, and the Colfax Lions take this means of expressing their appreciation of your good work.

Yours in cooperation,

COLFAX LIONS CLUB.
By F. E. West, Secretary.

Letter from George Herz:

San Bernardino, California, January 13, 1930.

Mr. C. H. Purcell,
State Highway Engineer,
Sacramento, California.

My dear Mr. Purcell:

I wish to take this opportunity to express to you and to the Highway Department, my observation and appreciation of the manner in which the highway employees handled the traffic congestion on the snow-bound Cajon Pass, on Sunday, January 12.

I was snowbound on the Pass from one o'clock in the afternoon until after seven o'clock that evening, without being able to move in either direction, which gave me ample time and opportunity to watch your men trying to untangle one of the worst traffic jams that I have ever seen. It was one of the worst blizzards that I have ever experienced anywhere, not excepting the Rocky Mountains, and your men were right in the thick of it at all times. They never lost their tempers and were always cheerful, giving a helping hand wherever they could, until the knot was untied and the traffic began to flow in both directions again, which was after 7 p.m.

In talking to several of your men, I was informed that they had not been off of the job for over twenty-four hours, and had not had anything to eat during that time.

Inasmuch as I am engaged in road construction, I know from personal experience what it is to keep traffic moving and to keep everybody satisfied and in good humor. Therefore, I repeat again, that your men did everything humanly possible to keep everybody satisfied, and did the best that could be done under the circumstances.

With best regards, I remain

Yours sincerely,

GEORGE HERZ.

STATE SAFEGUARDS ITS CONSTRUCTION BY THOROUGH SUPERVISION IN FIELD

(Continued from page 9.)

tractor has laid out his lines it is the duty of the field superintendent to personally check every measurement for correctness and see that each nail or saw cut is properly indicated on the batter boards before any construction is begun. He must then see that these points are properly guarded and preserved during their entire usefulness and that they are available for future checking of work.

BEARING VALUES OF SOIL

Before a projected building is started in the designing room, a survey of the proposed site is made and where the soil bearing values are already known, test holes are dug adjacent to and within the lines of the foundation so that approximate footing depths can be determined.

When a site is selected on entirely new and unknown ground, the bearing value of the soil is determined by load tests prior to the design of the foundation footings.

During the excavating of footing trenches, etc., it is the express duty and responsibility of the field superintendent to carefully observe the nature and character of the formations encountered and the depths at which the proper bearing soil is found so that any necessary changes in the footing depths can be made by the structural designer which will effect a saving by change order to the contractor.

These observations also sometimes result in extra depth excavation requirements to reach proper bearing and in such cases the result is an extra charge by the contractor. The amount of this saving or extra, as the case may be, is determined by a fixed unit price in the contractor's bid which covers the material and labor involved. This unit price is called for in anticipation of possible variations and due to the fact that in order to obtain comparable bids the bidders must have definite depths to figure on.

These variations are measured both by the field superintendent and the contractor and agreed upon before concrete is poured. The figures are reported to the main office where the exact deduction or addition is calculated and settlement is made with the contractor accordingly.

One of the most important functions of our field superintendents at the start of a project is to see that the contractor proceeds early

to arrange for delivery of concrete aggregates which he believes will pass the tests provided for in our specifications. Obviously this is necessary so that the contractor does not find himself without approved material when he is ready to pour footings.

TESTING MATERIALS

Usually only small amounts of each size of aggregate are delivered, pending result of tests, representative samples of these being selected by the field superintendent and divided into two parts, one to be forwarded to the testing laboratory and the other retained by him for comparison with subsequent deliveries in case the test proves satisfactory and the material is approved for use.

Reinforcing steel is also subjected to rigid tests and must be approved by the laboratory before it can be used. This test is sometimes made at the vendor's warehouse by a testing engineer from the state's laboratory to avoid expense of shipping and delay in case of rejection, and especially in cases where bending and fabricating is to be done at the warehouse before shipping to the job.

This method is obviously advantageous to all parties concerned and invariably results in more accurate bending than is usually obtained where the work is done on the site with the use of portable hand tools only. Contractors generally throughout the state have come to realize that this phase of the work on state construction is rigidly inspected and that narrow variation limits are imposed, and as a result, a constantly increasing better class of workmanship is being obtained.

Steel carefully bent to detail makes for simplicity in placing and saves labor cost in the field. Most experienced contractors prefer to sublet this branch of the work "furnished and installed" and naturally a better class of workmanship is obtained due to the skill and knowledge of specialists who install the work.

Many other materials which enter into the construction of the building from foundation to roof and finally on the finish such as stucco and paint, require tests and written approval before they are allowed to be used. When it is realized that the state is in the business of designing and constructing buildings for permanent use at the various institutions, and never for sale, it will be readily understood why these rigid tests are made and the specified requirements insisted upon.

REQUIREMENTS OF INSTITUTIONS DIFFER

Carefully thought out layouts for all piping and fixtures such as plumbing, steam, and electricity, are made by our mechanical section and these often call for special methods of installation due to the unusual requirements of individual institutions.

That which is proper practice at a hospital for insane is not altogether a proper installation in a prison and very naturally neither of these are suitable in administration buildings or residences. From observation and study reaching back over a period of many years, it has been possible to devise installations that meet practically every requirement and the various schemes are now pretty well standardized and satisfactory.

TRAINED IN WORK

It is an old truth that repetition of performance increases accuracy and efficiency and in the building game this is truly demonstrated.

By far the majority of our field force is composed of men who have been in the employ of the division for many years and have successfully conducted work of various kinds and magnitudes both by day labor and on contract basis and they have come to know the standards and methods which by test have proven most satisfactory and adaptable to the requirements of the various institutions. In their constant effort to obtain the best finished results, they have become weaned away from the practice of slipshod or questionable methods sometimes attempted by the less reliable or more careless contractors and are able to detect at once any tendency toward inferior work.

Since there is an appreciable degree of variation between most of our work and the every day run of work encountered by contractors, it can be readily understood that the experience of both our designing and field forces is a valuable asset to the division and represents a distinct intrinsic value that can not be denied.

Experience is a safe teacher and requires time and opportunity to achieve. The only known short cut to experience is constant contact with the work and an inquisitive and observing nature which demands to know why as well as how things are done, and an exceptional memory for detail of the things observed. A man with these characteristics will, and unquestionably does, go further in his line of endeavor in a shorter time because his knowledge is supported by a background of experience which is ever at hand to provide resources to guide him. This is usually the type of man who finds new applications of old principles, or combinations of them, which tend to advance his profession.

Some of the greatest requirements of a field superintendent or resident engineer are, fundamental knowledge of building principles, wide experience in the various applications of those principles, ability and willingness to acquaint himself with the detailed requirements of the project in hand through the medium of the plans and specifications, a forceful character with executive ability and tact, and above all, integrity and loyalty to his superiors.

The Division of Architecture is now busily engaged in keeping up with the construction program for the present biennium and the work both in the office and in the field is being carried forward according to schedule.

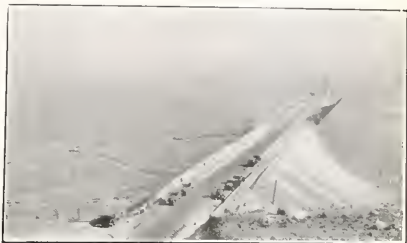
KEEP SCENIC HIGHWAYS SCENIC

(Continued from page 15.)

declared against the roadway advertisers in real earnest by those who love and appreciate the beauties of the state, it will not be long before the lovely drives which are still unmarred will likewise fall a prey to the sign board artist and the out-of-door paper hangers.

When the need for state legislation directed against the inroads of the advertisers is fully realized by the public the members of the California Committee for Restriction of Out-door Advertising feel that their efforts will be appreciated and sponsored. The desire to make the whole of California into a glorious

LARGE FILL MADE BY SLUICING METHOD



The above view is that of a large fill on Kern River road about 10 miles east of Bakersfield which has recently been completed. The fill has a maximum height of 77 feet and was constructed mostly by sluicing. This section is on the Santa Maria to Freeman highway via Bakersfield and Walker's Pass.



This second picture is that of the large cut lying just to the west of the large fill above mentioned and from which material was obtained to construct the fill. The cut has a maximum depth of 66 feet and approximately 80,000 cubic yards were removed, all of which was used to construct the fill. This large cut and fill are portions of a line change about three miles in length, which shortened the distance between Bakersfield and Kern Canyon by one-half mile.

park is the end in view. No public parks in the state permit roadside advertising to detract from the beauty of the surroundings, and therefore the entire state can never lay claim to being a continuous park until regulations, which hold good in more restricted areas, are enforced along the highways.

MACHINE FINISHING FOR HOT-MIXED PAVEMENT IN CALIFORNIA

(Continued from page 12.)

thickness. Some difficulty is experienced in making the ribbons of mixture deposited by the spreader boxes lap over each other without rock pockets developing. One of the best methods to secure this result is to cut holes about six or eight inches square in the ends of the spreader box near the front of the box which will allow sufficient average mixture to run out to make the junction of the ribbons satisfactory.

We have found spreader boxes economical and satisfactory whenever a uniform thickness of surface of considerable depth is to be spread. Some contractors claim little saving where a surface less than 3-inch loose is to be spread. In spreading leveling course, contractors have resorted to numerous ingenious methods of spreading the surface of the course parallel with the true surface.

SIDE FORMS AND RAILS

Since it is now our common practice to require that side forms be left in place, such forms are of wood, usually a commercial, three inches in thickness and as deep as the pavement.

They are supported on hubs at four-foot intervals and are securely staked to prevent lateral movement. We require all forms to be surfaced on both edges. While it is quite possible to spread base or leveling course from the wooden side forms, it is not possible to spread surface with spreading machines as at present designed.

It is necessary to make an allowance for compression and for this purpose it is common practice to lay flat steel rails about three-quarters to seven-eighths of an inch in thickness by $2\frac{1}{2}$ inches to 3 inches in width on top of the wooden side forms to elevate the finishing machine a sufficient distance above the side forms to allow for compaction during rolling. These rails usually have a V-shaped or tongue and groove connection with each other to preserve alignment and are about ten feet in length. Usually three or four sets of rails are sufficient on the average job, as they are taken up and moved ahead as the work progresses. It is usual to nail the rails temporarily to the side forms.

FINISHING MACHINES

Two types of finishing machines are now in use in California both of which will spread,

rake, and finish asphalt concrete. Both types of machine are motor-driven and consist essentially of front and rear screed plates set about 10 feet apart, having a motion transverse to the pavement at the same time that the machine advances along the side forms. The raking elements are set in between the screeds and consist of steel pins set in heavy pipe as described elsewhere.

We require not only spreading but also raking and respreding by the rear screed on all of our work and in this respect our practice differs somewhat, I believe, from other localities where spreading only without raking is a usual practice. Since we have not tried our machines on sheet mixtures, I am unable to say from actual experience whether raking of these mixtures is essential with a screed machine, but from a large experience in laying sheet asphalt by hand methods, I would consider raking such surfaces as essential as raking asphalt concrete.

The two types of rakes mentioned, and which I will designate as the pendulum type and the sliding type, represent the different ideas of the manufacturers but they perform similar work.

The rake teeth which consist of steel pins from 8 inches to 14 inches in length and one-half to five-eighths of an inch in diameter are set 6 inches or less apart in two lines of double thickness pipe of 2 inches to $2\frac{1}{2}$ inches nominal diameter. The teeth are adjustable for projection and are fixed in place with set screws. The rake assembly extends the width of the machine, 10, 15, 20, or 30 feet as the case may be. The essential difference in the two types of machine now in use is the method of raking used.

In one machine, the rake teeth swing with a pendulum motion in opposite directions which stirs up the mixture in line with the direction of travel.

In the other machine, the entire rake assembly slides backward and forward between guides, the teeth plowing under and lifting the mixture at each forward stroke, and on the backward stroke assisting slightly perhaps the forward movement of the machine.

Both the pendulum and sliding motions are induced by means of an eccentric connected to a countershaft and operating crank arms which swing the rake's teeth or cause the whole raking element to slide.

The second method has, I think, certain advantages over the first, especially for thin surfaces.

The teeth are set to rake at from 16 to 20

strokes per minute, and have a travel independent of the forward motion of the machine of from 4 to 8 inches. It is not desirable that the rake speed should be too fast nor the stroke too short. The sliding type of rake may have a longer stroke and be slower than the pendulum type.

Essential features of the raking are the lifting of the coarser aggregate to the surface of the mixture and the formation of compression ridges. The coarse aggregate being lifted to the surface allows it to be reimbedded in the immediate wearing surface by rolling and thus forms a nonskid surface. The compression ridges between the furrows left by the rake teeth have a tendency to assist compression without distortion or travel in the mixture since the ridges are flattened out sideways by the roller instead of being driven ahead by it.

PAVING OPERATIONS

The paving operations in the construction of base and surface are as follows:

Paving mixture heated to approximately 280° F. is brought to the road in pneumatic-tired trucks of 5- to 6-ton capacity.

If a leveling course is to be laid on old concrete, a paint coat of emulsified asphalt is first applied to the concrete base.

The trucks are backed up to spreader boxes and are attached to them by means of a quick detachable chain hitch.

The mixture is roughly spread about 2 inches thicker than it will be left by the finishing machine and is at once spread to a uniform thickness using the screeds of the finishing machines only as a usual thing. Some operators use the rakes also as they think they assist compression. Rolling is begun as soon as the machines have spread a sufficient amount of material. Practically no handwork is required on the base mixture.

Base mixture is usually carried forward for such a distance as to allow a full day's run on surface, or for even a longer distance so that it will not be necessary to make so many shifts of the finishing machine. On one large job at present under construction, two finishing machines are in use, one on base and one on surface, which obviates the necessity of moving either one back on the job. Machines are usually moved off the pavement at night to permit its use by through traffic.

Surface operations follow closely on the methods used in constructing base with a number of additional operations, however. It is first necessary to lay steel rails three-quarters to seven-eighths of an inch thick on top of the side forms, as hereinbefore

described, to give the screeds the proper elevation above the side forms to allow for compression in rolling.

The screeds, which are cut at the center, are adjusted to the correct crown by means of hand wheels. The rake teeth are lowered into the mixture and in the sliding type are set at an angle of about 45 degrees.

During operation, it is desirable to carry a wave of mixture about half the height of the front screed in front of that screed and a smaller wave of mixture in front of the rear screed.

During the operation of the machine, the rakes are forming ridges and furrows longitudinal with the road and the rear screed is just knocking the top off the ridges, leaving coarse aggregate exposed for rolling. The machines are usually equipped for four wheel drive and will operate at a forward speed of up to 10 feet per minute.

ROLLING

Rolling is done with 10-ton macadam rollers for the first compaction followed by 6- to 8-ton tandem rollers for final smoothing.

Following the first rolling of the surface, our customary practice is to scatter asphalt coated stone chips, passing three-eighths inch and retained on one-quarter inch over the surface to fill any small voids which may be left in the surface and to provide additional assurance that the surface will be of uniform nonskid texture. Rolling is then continued until no more compaction is possible and the surface is as smooth as it can be made.

SMOOTHNESS

Surface smoothness is checked during construction by several different methods devised by ingenious resident engineers. The simplest method is, of course, to use a 10-foot straightedge, but as this requires a good deal of stooping, other means have been devised.

One automatic device consists of a straightedge on three wheels so arranged that a rise or fall of the central wheel of more than one-quarter inch rings a bell; another has a similar bell arrangement but the straightedge consists of two sled runners, while another is a weighted sled which scores the high points as it is dragged after the roller.

The official record of roughness, however, is recorded on a vialog or roughometer attached to an automobile operating at twenty miles per hour. This machine is left constantly calibrated by checking its operation over two or three standard sections of pavement which have been run over many times

and on which the roughness has been accurately determined.

The following tabulation indicates the average smoothness we have obtained on some 200 miles of asphalt concrete pavement laid in the last five years:

Year	Miles laid	Roughness index	Remarks
1924	23.84	30.1	Hand finish
1925	24.11	33.2	Hand finish
1926	49.34	24.1	Hand finish
1927	35.35	25.2-14.6	Machine finish begun
1928	60.81	30.9-14.7	

We have been able to reduce the roughness to as low as eight units on some especially well finished jobs without sacrifice of the nonskid feature.

We find that roughness increases with each year a pavement is in use. One of our asphalt pavements laid three years ago with a roughness index of 11 now has a roughness index of 14.

OUTPUT

The introduction of finishing machines has, as stated before, greatly increased the average tonnage output of paving plants, and has also decreased the cost per ton as shown in the following tabulation:

Year	Tonnage Mar.	Per 8-hr. day average	Average cost per ton
1924	244	194	\$7.27
1925	319	214	6.43
1926	388	333	5.13
1927	366	352	5.68
1928	574	404	4.89

Naturally, this increase in output has required larger plants, and where a 1500- or 2000-pound batch box was the usual size in 1924, we are now using batch boxes up to 5000 pounds capacity with the cost of the plant in proportion.

In conclusion, I wish to predict that the more extensive use of machinery in the construction of asphaltic pavements has opened a new era for this material and that with the growth of knowledge as to the economic and engineering considerations which should govern the selection of pavement types, the use of asphaltic pavements in their proper locations will reach proportions sufficient to satisfy its most ardent advocates without detracting from the merits and usability of other types of pavement in their proper environment.

For those who wish to trace the development of machine finished asphalt construction, the following references will be of value:

Engineering News-Record

- (1) Dec. 1, 1927, p. 869.
Equipment to replace hand tools, in surfacing asphalt. (Hand operated strikeoff rake—Exper. by C. S. Pope).
- (2) Oct. 13, 1927, p. 602.
Concrete road finishing machine used on asphalt by Griffith Company (at Placentia, Orange Co., Cal.). Paving work.
- (3) Mar. 29, 1928, p. 510-11.
Concrete finishing machine spreads asphalt surfacing. By Guy H. James, resident engineer, Oklahoma State Highway Department.
- (4) Apr. 5, 1928, p. 536.
Machine-finished asphalt—Editorial.
- (5) Apr. 12, 1928, p. 591.
Blade grader finishes asphalt road surface. By W. G. Dickey, Richmond, Ind.
- (6) Nov. 15, 1928, p. 727.
Rotating rake on Finishing Machine spreads rock asphalt. By John L. Humbard, Knoxville, Tenn.
- (7) Apr. 18, 1929, p. 623.
Machine-finished asphalt pavt. adopted in Cal. By C. S. Pope, Construction Engineer, California Division of Highways.
- (8) Mar. 7, 1929, p. 376.
Finishing machine lays asphalt in Oklahoma. By D. A. Wood, Engineer of Tests, Oklahoma Highway Commission.
- (9) Mar. 21, 1929, p. 471.
Hand and machine spread asphalt costs compared. By J. F. Tuttle, Ass't. Div. Engineer, South Carolina.

THE ROAD BUILDERS

O, Brothers of the open road,
Be mindful in your motors,
Of this, our common gift bestowed
By less enfeebled voters.
Be mindful how these thoroughfares,
Were made to serve all comers—
The meek and humble millionaires,
The plutocratic plumbers.

O, Brothers, when you motor out
In double fours or fivers,
To lamp the landscape round about
And agitate your livers,
The while your gas-consumer flies,
O'er beaten trails and byways—
O, breathe a prayer and bless the guys
That built the bloomin' highways.

Be mindful of their lowly lot,
They rarely ride as you do.
You drive nice cars, but they do not,
At least a very few do.
And life would be a dreary hike
If it were not for fellows like
The ginks that give us highways.

—C. Wiles Hallock.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MEER -----Director
GEORGE C. MANSFIELD -----Editor

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CALIFORNIA—PLAYGROUND OF THE WORLD

Records of the Division of Motor Vehicles and the California Highway Patrol revealed that motorists from every state in the Union and practically every important country in the world visited California during the tourist season of 1929.

The time-honored slogan of California boosters that the state is the "playground of the nation" changed to the playground of the world for even such obscure countries as New Zealand, Guam and Panama sent their quota of pleasure seekers by motor.

Under the law providing that visitors permits be issued for nonresident cars in the state ten days or more, the records reveal 90,083 permits issued for the year. Approximately 140,000 nonresident cars were checked through the border "courtesy" stations maintained by the patrol. It is estimated that some 30,000 more came into the state over routes on which stations are not maintained.

State officials estimate the average number of persons in each car at three and that these tourists spent sums here totaling millions. Thousands of these motorists remain to make their homes here.

The largest number of foreign cars—53,909 in all—were checked through the border station located at Yuma. The Daggett station checked 36,657 more, the Dunsmuir station 29,257 and Clam Beach station 15,694. The stations at Donner Lake and Myers, operated only a portion of the year because of the heavy snow, checked in 7712 and 1598 respectively.

Of the states from which nonresident cars came, Washington led with 11,312 and the sister state of Oregon was second with 9600. Colorado was fourth with 6000 and Arizona fifth with 5100.

The Down East country was well represented with 151 cars from Maine, 71 from Vermont, 105 from New Hampshire, etc.

All the Dixie states had their quota, Virginia leading with 224. The folks from Iowa had 2660 visitors and 4560 came from Illinois.

France had nine cars here during the year and Germany had four. One motorist came from Japan and another from Italy. Our Canadian neighbors were interested enough to send 800 visitors.

California offers extremely liberal registration inducements for the out-of-state motorists as they may stay here six months without securing a California license.

Nonresident permits by state and country follow:

Total Nonresident Permits Issued for Year 1929			
Alabama	182	Mississippi	96
Alaska	48	Missouri	2,340
Arizona	5,100	Montana	1,340
Arkansas	530	Nebraska	2,140
Australia	4	Nevada	2,160
Baja California	3	New Hampshire	105
Brazil	1	New Jersey	840
Canada	800	New Mexico	890
China	4	New York	3,240
Colorado	6,000	New Zealand	1
Connecticut	360	North Carolina	155
Cuba	4	North Dakota	630
Delaware	4	Nova Scotia	2
Dist. of Columbia	344	Ohio	3,400
England	8	Oklahoma	3,040
Florida	530	Oregon	9,600
France	9	Panama	18
Georgia	162	Pennsylvania	1,800
Germany	4	Philippine Islands	14
Guam	4	Rhode Island	138
Hawaii	283	South America	3
Idaho	2,050	South Carolina	55
Illinois	4,560	South Dakota	810
Indiana	2,100	Tennessee	372
Iowa	2,560	Texas	4,380
Italy	1	Utah	2,760
Japan	1	Vermont	71
Kansas	2,420	Virginia	224
Kentucky	340	Washington	11,312
Louisiana	311	West Indies	1
Maine	151	West Virginia	219
Maryland	232	Wisconsin	1,280
Massachusetts	700	Wyoming	900
Mexico	56		
Michigan	3,580	Total	90,083
Minnesota	2,160		

LINES TO EINSTEIN

In intellect you're over us
By something like 1,000,000 +
You plot your theory and its sequels,
Nor need to bow to peers or —
And tell professors how you've fared
With 7y or 2x².
While we don't even dare to try
To guess what light's —,
We've not the sense to give a hoot
About infinity's V
—And yet we hope you won't malign us
Because our intellect is —.

—Passing Show.

Stopped by a motor cop for speeding, a motorist explained that he was rushing to see his lawyer. "That's fine" said the cop, "you'll have more news for him now."

U. S. State Join to Solve Problems of Water, Bay Bridge

The following articles were carried by the Associated Press dispatches under the dates appearing below:

WASHINGTON, Aug. 13.—President Hoover announced today that he and Governor C. C. Young of California had agreed to the appointment of federal and state commissions to study two outstanding problems of the golden state; water power development and the bridging of San Francisco Bay.

The decision was made known at the White House by the President who holds a two-fold interest in the undertakings, that of chief executive of the nation and as a citizen of California.

TWO COMMISSIONS

One commission will take under advisement the development of California rivers with a view to irrigation, navigation, flood control and power. The other will devote its attention to a solution of the problems involved in the proposed construction of a bridge from San Francisco to Alameda.

The commissions are the result of extended collaboration between the President and the Governor, in the course of which the two subjects were gone into thoroughly.

The Water Commission is to develop a coordinated policy of water development. Mr. Hoover explained that at present there were nine independent agencies involved in water development in the state and that it was proposed that the work and programs of each should be coordinated.

The Bridge Commission is to determine upon a suitable location for the proposed span.

President Hoover's policy is expected to have far reaching effects on the future development of California, both agriculturally and industrially.

COMPLETE COORDINATION

The policy embraces complete coordination between federal and state governments in policies to be pursued in a long view development of the President's adopted state as to immigration, flood control, navigation and power.

The President announced he had requested the War Department, which controls navigation channels and flood control, the power commission, which controls water power permits, and the Interior Department which is interested in irrigation, to designate one member each on the commission which Governor Young is appointing from among state agencies and leading citizens.

Some years ago Mr. Hoover advocated coordination of a multitude of activities, government and otherwise, engaged in direct and indirect control and development of a California water supply. This long has been the subject of deep interest to him because of intimate personal knowledge of the situation gained in his many visits to various parts of the state.

WATER PLAN ESSENTIAL

His view, as expressed often to friends in days before he became President, is that a comprehensive plan for development and utilization of its existing water supply is absolutely essential to the full growth of the great empire west of the Rockies. He esti-

mated that hundreds of thousands of potential horsepower flowed annually to the sea almost unbarrened and unchecked. With this went millions of gallons of water which might be utilized for irrigation purposes, making fertile thousands of acres of now practically waste lands.

The task ahead of the state and federal governments is recognized as a gigantic one, but opinion in administration circles is that it at least can be simplified through closest cooperation between federal and state agencies which for years have been acting independently and in more or less haphazard fashion.

TO PRESERVE FORESTS

Involved in the program is the preservation of forests so that snows will not melt rapidly in the spring, causing floods and a resultant shortage of water in late summer. This problem has long given concern, and for many years there has been an almost imperceptible but gradual shortening of the water season, not only in California, but also in other states.

Anxious to remove difficulties which have stood in the way of erection of a bridge across San Francisco Bay, President Hoover, in cooperation with Governor Young, has determined upon appointment of a commission representing state and national interests to make a study of the project.

HOOVER WANTS BRIDGE

Mr. Hoover said he regarded the proposed bridge as of great economic value to San Francisco, Alameda and Oakland, and a project which should be carried through to completion.

The commission determined upon is to consist of two representatives of the War Department, two from the Navy Department, two from the State of California and one each from San Francisco and Alameda, and a westerner to represent the Federal Government generally, who will be Mark L. Requa, Mr. Hoover said, if he will undertake the task.

One of the first duties of the commission will be to determine upon a suitable location for the bridge. The next step will be securing complete consent of the War and Navy department for construction of a span at that place. Construction of the bridge has been the subject of considerable dispute in Washington in recent years. Hearings have been held by both houses of Congress and the War Department. Considerable objection has been raised by the War and Navy departments on the ground that such a bridge would be a threat to the defense of San Francisco Bay.

YOUNG AND HOOVER STUDY PROBLEMS TWO YEARS

LOS ANGELES, Aug. 13.—(AP)—Governor C. C. Young told the Associated Press at his office here today the agreement reached in Washington for a joint federal and state commission to study facts as to developments of rivers in California culminated negotiations begun more than two years ago between himself and President Hoover, then Secretary of Commerce.

The Governor said legislation passed at the last session of the legislature made it possible to bring these negotiations to an end, and Director of Public Works B. B. Meek had been sent to Washington to confer with the President upon the appointment of such a commission.

"I am happy to hear that a basis upon which the state and federal government may proceed together in the development of California rivers for irrigation, navigation, flood control and water power has been reached," Governor Young said.

The Governor added that appointment of the California commission must await the return of Meek, as he wished to talk over with him the attitude of the federal government on the developments before making definite selections.

HOOVER IN SYMPATHY

"Mr. Hoover early expressed sympathy with the projects contemplated and showed a clear understanding of the values to be derived from the development of California rivers," Governor Young said. "The appointment of a joint commission to survey our natural resources virtually guarantees the working out of an acceptable basis of problems arising from their development affecting both the state and the nation."

Governor Young said he had instructed Meek to confer with federal authorities upon questions arising from the proposed construction of a bridge across the San Francisco Bay, after discussion of California river development had been culminated.

BRIDGE PROJECT VITAL

"The project is of vital interest to the state and the San Francisco Bay region," Governor Young said, "but was secondary to the major object of securing cooperation towards the development of rivers."

"Before Meek left for Washington he suggested that while he was there he should seek federal cooperation on the bridge project, and I assented."

Governor Young expressed gratitude that a federal bridge commission had been authorized. In his opinion, he said, a survey by the federal group would be a great factor in the eventual completion of the project.

APPLESAUCE

Dear Editor: Will you answer the following question through your columns to settle an argument: How many apples did Adam and Eve eat?

Some say Adam 8 and Eve 2, a total of 10 only. Now we figure the thing out far differently. Eve 8 and Adam 8 also, total 16. And yet the above figures are entirely wrong. If Eve 8 and Adam 82—certainly the total will be 90.

Scientific men, however, on the strength of the theory that the antediluvians were a race of giants, reason something like this: Eve S1, Adam S2, total 163. Wrong again. What could be clearer than if Eve S1 and Adam S12, would not the total be S93? If Eve S11st and Adam S12 would not the total be 1623?

We believe the following to be a fair solution: Eve S14 Adam: Adam S124 Eve—total S938. Still another calculation is as follows: If Eve S14 Adam, Adam S122 oblige Eve—total S936. We think this, however, not a sufficient quantity, for, though we admit that Eve S14 Adam, Adam if he S081242 keep Eve company, would make the total S,082,056.

All wrong. Eve, when she S1812 many, and probably she felt sorry for it, but her companion, in order to relieve her grief, S12. Therefore, when Adam S18120 pity Eve's depressed spirits. Hence both ate S1,896,864 apples—Irrving E. Tier, *Exchange*.

Despite the things all the other women in the world say about her, Mrs. Anne Lindburgh says some right "cute" things herself. When she visited Mr. Hoover at his camp on the Rapidan, she wrote to some of her Smith College friends, as follows:

You girls have always called me slow,

Now beat this if you can—

When a Great Man named his mountain camp,

He called it Rapid Anne!

JANUARY BULLETIN OF SNOW SURVEY AND PRECIPITATION DATA

The Division of Water Resources, State Department of Public Works has prepared a bulletin covering snow survey and precipitation data up to February 1st for this season. This bulletin is being sent to irrigation districts, water companies, public utilities, water users, engineers and many others, and is available for distribution to any to whom the data are of importance or interest.

The snow surveys have been made pursuant to an act and appropriation by the last legislature, empowering and directing the Department to do this work. During the summer and fall last year "snow courses" throughout the Sierra from the Upper Sacramento River basin on the north to Kern River basin on the south, were established and the necessary preparations made in the way of stocking shelter cabins with provisions, bedding, and wood, providing equipment for the surveys, and making the arrangements for the men to do the work. Most of the surveys are made through cooperation with agencies such as the public utilities, irrigation districts, etc., which have men located in the mountains in connection with their regular duties. One hundred and fifty snow course locations have been made and all of these will be surveyed about the first of April to furnish the data upon which estimates of the April-July stream flow may be made. In each major stream basin certain "key" courses have been selected at which snow surveys will be made monthly from January to May. This is done to furnish data for progress reports of snow and precipitation conditions prior to the time of the main survey about April 1st. The bulletin now being sent out gives the results of the surveys at the key courses up to February 1st and furnishes also the data on seasonal precipitation to this date at nearly all stations of the U. S. Weather Bureau, state and private agencies located in the mountainous portions of the stream basins.

Conditions to February 1st.

As most of the snow courses are newly established, no comparison with results of previous years or reference to "normals" can be made. In a few instances, however, the snow surveys have been conducted for many years, and the comparisons in these cases are given. In Tahoe basin, courses at Tahoe City and Marlette Lake show a water content between 30 and 40 per cent of the entire seasonal normal (October to May). In the Yuba basin, courses at Summit and Lake Fordyce show a water content about 35 per cent of the entire seasonal normal and in the Mokelumne basin a crest course at Blue Lakes shows a water content 45 per cent of the entire seasonal normal.

The comparison of conditions to February 1st with normal, using the data from the precipitation stations shows in general that the precipitation in the northern stream basins, Upper Sacramento, Pit, McCloud, Feather and Yuba, ranges from about 20 per cent above to about 15 per cent below normal. In the central basins, American, Mokelumne, Stanislaus, Tuolumne, Merced, and Mono, it varies from about normal to as much as 40 per cent below, and in the southern basins, Upper San Joaquin, Kings, Kaweah, and Kern, it is practically 50 per cent below normal.

Sister: What shall we give father for his birthday present?

Brother: Let's let him drive the car.

State Highway Progress Reports

COLUSA COUNTY

C. R. Merrill of Willows was awarded a contract for widening the roadbed between Colusa and Meridian. The work consists of widening the present narrow, roadbed to a uniform width of 26 feet throughout. The contractor started work on November 12, 1929 and was making very good progress until temporarily closed down on account of rain December 8.

DEL NORTE COUNTY

The Holdener Construction Company have a contract for stockpiling crushed rock screenings over 35 miles of the Redwood Highway between the new Houchi Bridge over Smith River and the Oregon line. The contractors have approximately 40 per cent of the work completed.

The contractors have engaged Smith Bros. to complete the work and the crushing plant has just been moved to a new location and they are again producing.

Smith Bros. have a contract for placing corrugated metal pipe subdrains along the state highway between a point approximately 5 miles east of Crescent City and the Houchi Bridge over Smith River. The work is practically complete.

EL DORADO COUNTY

Construction of oil-treated rock borders between Folsom and Clarks Corner is completed. The completed project provides a paved traveled way 18 feet wide with super-elevated curves. The work was financed from the State Highway maintenance fund budgeted for eighty-first and eighty-second fiscal years. The improvement was made under contract to W. H. Larson of Sacramento and the period of construction was from May to December, 1929.

Between Riverton and Kyburz on Route 11 the grading of 5.75 miles is in progress. As a Forest Highway, this is a cooperative project to which \$140,000 was subscribed as the state's share. This contract was awarded to G. E. Finnell and is under the supervision of federal engineers.

Hemstreet & Bell completed work on their contract for surfacing with untreated crushed gravel that portion of the Mother Lode Highway between Logtown and about 4 miles southerly. This work was financed from the State Highway maintenance fund.

Nate Lovelace is working on his contract for grading between Bay View Rest and Eagle Falls. Progress is slow. If weather permits, the contractor will carry on his work through the winter.

MONTEREY COUNTY

The reconstruction of the Coast Highway from Salinas south 10 miles to Chualar by the Peninsula

Paving Company is complete. This project covers a 36-foot roadbed with a 20-foot second story asphaltic concrete pavement. The Peninsula Paving Company has made excellent progress in handling this work.

At Spence, 5 miles south of Salinas, Triberti-Massaró, contractors, are constructing abutments for an underpass of the Southern Pacific Railroad. This work is under the supervision of the Bridge Department.

A new bridge across the Salinas River at San Ardo, under supervision of the Bridge Department, is being built by Ben C. Gerwick, contractor. The change of line and approaches to the bridge, 1.5 miles in length, involve grading a 36-foot roadbed and placing a 20-foot Portland cement concrete pavement. Frederickson and Watson and Frederickson Brothers are the contractors.

The plans for a new bridge and a major change of line at the Bradley Crossing of the Salinas River are held in abeyance pending the location of the road northerly from the bridge.

On the San Simeon-Carmel Highway a timber bridge of ten 19-foot spans across Villa Creek is nearing completion. H. C. Whitty is contractor and the work is under the supervision of the Bridge Department.

On the San Simeon-Carmel Highway construction work is in progress with convict labor. Two camps are maintained. At Little Sur a crew of 95 men and two power shovels are working and between Villa Creek and Alder Creek about the same number of men with three power shovels are working. About 7.3 miles of graded roadway has been completed. Surveys for the location of the road are in progress between the two camps.

NEVADA COUNTY

The Callahan Construction Company on December 12 suspended work for the winter on their contract for grading and surfacing between Indian Springs and Soda Springs near the summit of the Colfax-Truckee road.

Grading and surfacing 11.7 miles between Nevada City and Washington Road is being performed under contract awarded to C. B. Adams. This section, consistent with the rest of the Ukiah-Tahoe Highway, will consist of a 24-foot roadbed. An oil-mixed crushed rock surface, 20 feet wide, is to be placed by the terms of the contract. The grading is practically complete and about 60 per cent of untreated surfacing has been placed. On account of weather conditions, it will be impossible to oil-treat the surfacing until warmer weather. Accordingly, this work will not be complete until some time in June.

NEVADA AND PLACER COUNTIES

Between Roseville and one-half mile north of Andora subway, bituminous macadam surfacing and rock borders have been constructed under contract to J. E. Johnston.

T. E. Connolly on January 4, 1930, suspended work for the winter on his grading contract between Air-

port and Indian Springs on Route 37. 9.3 miles of construction is in progress. This project covers the construction of a 28-foot roadbed. Construction will be resumed next year.

ORANGE COUNTY

The contract for a line change 0.7 of a mile in length between Serra and San Juan Capistrano has just been completed. This work consisted of constructing a 40-foot graded roadbed with Portland cement concrete pavement, 20 feet by 7 inches. Matich Bros. were the contractors.

A contract for paving one-half width between Santa Ana and Anaheim was awarded on June 11th to Griffith Company. This section is 4.9 miles long. The paving work was done in cooperation with Orange County, the state paying for a strip of pavement 28 feet by 7 inches and the county paying for a like amount. The state's portion of this highway is completed, and work is nearly completed on the county's portion.

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90- to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Macco Construction Co. When this work is completed the pavement will be 30 feet wide for the entire distance. It is expected that this work will be completed by next December.

A small contract for replacing temporary surfacing with Portland cement concrete, 30 feet wide, between Dana Point and Serra is nearly completed. Matich Bros. are the contractors on this work.

SAN BENITO COUNTY

Surveys have been completed and plans are being prepared for the reconstruction of Route 22 from a point 3.2 miles north of Hollister to San Felipe on the Pacheco Pass lateral, a distance of about 5 miles.

SAN DIEGO COUNTY

Work has been completed of constructing oil rock borders on portions of the Coast Route between the city limits of San Diego and Oceanside. The R. E. Hazard Contracting Company of San Diego were the contractors.

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 46-foot graded roadbed. About 3 miles have been graded to date.

The contract for grading a roadbed 36 feet wide and placing of Portland cement concrete pavement 20 feet by 7 inches is nearly completed between Pine Valley and Kitchen Creek on the San Diego-El Centro Highway. Basich Brothers are the contractors.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. Good progress is being made on this contract.

A contract for grading 3.9 miles of 36-foot roadbed between Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. About 3 miles

of rough grading is completed, and grading is now in progress on about one mile. It is expected that paving will start shortly. This section is on the San Diego-El Centro Highway.

SAN LUIS OBISPO COUNTY

On the Coast Highway between Atascadero and Paso Robles, a distance of 9.6 miles, the road is being reconstructed with a 36-foot roadbed and a 20-foot asphaltic concrete pavement. Steel Finley is the contractor.

In the town of Atascadero, M. J. Bevanda, contractor, is constructing street improvements which include full width street work on the highway through the town. This is being handled through a local improvement district.

Bids have been received on the reconstruction of the Coast Highway from the Santa Maria River to Los Berros Creek, a distance of 7.2 miles. This is to be a 36-foot roadbed and a 20-foot Portland cement concrete pavement.

Surveys have been completed on the proposed reconstruction of the Coast Highway between San Luis Obispo and Cuesta Grade.

SANTA BARBARA COUNTY

On the Coast Highway west of Santa Barbara, between Eagle Creek and El Capitan Creek, oil surface on crusher run base rock shoulder, 3 feet wide, are being placed by the Cornwall Construction Company, contractors.

Bids have been received on the reconstruction of the Coast Highway from Wigmore to Zaca, a distance of 4 miles. The roadbed is to be 36 feet wide and the pavement 20-foot Portland cement concrete. This project is located about 4 miles south of Los Alamos.

Plans are complete for the reconstruction of a portion of the Cuyama lateral from the second crossing of the Cuyama River to the Kern County Line, a distance of about 38 miles. A portion of this project is in San Luis Obispo County.

Plans are being prepared for a change of line at Nojoqui Creek on the Coast Highway about 2 miles south of Buelton. This will involve a new bridge over the creek.

HUMBOLDT COUNTY

The work of producing and stockpiling bituminous macadam rock along the Redwood Highway for a 20-foot by 2-inch bituminous macadam pavement between a point 1 mile south of Orick and the northerly Humboldt County line has been taken over by the state for completion. It is intended that this rock shall be stockpiled during the winter season in order that the Heafey-Moore Company who have the contract for placing the bituminous macadam may proceed with the work as soon as weather conditions permit next summer.

The Heafey-Moore Company who have the contract for placing a 20-foot by 2-inch bituminous macadam pavement for the 10.7 miles between Mill Creek and Trinidad have shut down for the winter and expect to resume the work of completing their contract as soon as weather conditions permit next summer.

Mercer-Fraser Company have completed the construction of the overhead crossing of the highway over

the Northwestern Pacific Railroad and the Arcata and Mad River Railroad approximately 1 mile north of Arcata, and this new section of highway from Arcata to Mill Creek, 4 miles in length, has now been opened up to the traveling public.

The E. C. Coats contract for grading and surfacing a 28-foot standard roadway on that portion of the Redwood Highway between Fish Creek Grove and Stephens Grove in the vicinity of Miranda for a distance of 2.9 miles is progressing very satisfactorily considering the handicaps due to the winter conditions. The work is approximately 25 per cent complete.

The Englehart Paving and Construction Company have the contract for producing and placing crushed rock surfacing on approximately 7.3 miles of the Redwood Highway between Dean Creek and Fish Creek, approximately 6 miles south of Miranda. The contractor has his crushing plant set up and has just started placing material on the roadway.

H. H. Boomer Company who have the contract for grading and surfacing that portion of the state highway, approximately 1.2 miles in length from Garberville northerly, is well advanced with his clearing and drainage structure operations and has started some excavation work. The work is approximately 5 per cent complete, but winter weather conditions prohibit normal progress.

INYO COUNTY

From the southerly boundary of Inyo County to Little Lake, a distance of approximately 9.8 miles, Fred W. Nighbert, is the contractor. This project will be completed in May, 1930. B. M. Gallagher is resident engineer.

From Little Lake to Coso Junction, a distance of approximately 3.7 miles Fred W. Nighbert is the contractor. This project will be completed in May, 1930. B. M. Gallagher is resident engineer.

From Coso Junction to Olancha, a distance of approximately 21.3 miles, the Allied Contractors have commenced grading operations. This project is to be completed in September, 1930. S. C. Risley is resident engineer.

Widening of shoulders is under way north of Independence. This work is being done by day labor forces, under the direction of Paul Peak, foreman.

KERN COUNTY

Bids were opened on January 2, 1930, for grading of a standard 36-foot roadbed and placing thereon 20 feet of oil-treated surfacing, from the end of the present improvement at Cinco to 7 miles north of Ricardo, a distance of approximately 16 miles. George Herz and Company of San Bernardino were low bidders.

From 7 miles north of Ricardo to Olancha, there are at this time five contracts under way, all of which provide for the construction of a standard 36-foot graded roadbed, and the placing of an oil-treated surface 20 feet wide. The first of these contracts, extending to Freeman Junction, a distance of approximately 10.2 miles, is under contract to G. W. Ellis, and will be completed early in February, and is under the direction of V. E. Pearson, resident engineer.

From Freeman Junction to the northerly boundary of Kern County, a distance of approximately 13.9 miles, Bartlett & Mathews, Black & Hagey, are the

contractors. Work on this contract will probably be finished during the latter part of April, 1930. V. E. Pearson is resident engineer.

LAKE COUNTY

The grading of the Ukiah-Tahoe road between Clear Lake Oaks and Sweet Hollow Summit has been completed by convict labor forces. From the summit to Abbott Mine the 20-foot graded roadbed is being widened to 24 feet.

Von der Hellen, Pierson and Logan have completed their contract for grading and surfacing with untreated crushed gravel or stone between Lucerne and Clear Lake Oaks.

LOS ANGELES COUNTY

The contract for a line change immediately north of the Newhall tunnel has been awarded to McCray Co. Good progress is being made on this work. It is expected that this contract will be completed next June.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of 40-foot roadbed was awarded to H. W. Rohl Company on August 14th. Rough grading is in progress on one and one-half miles.

A contract for paving the Newhall alternate with Portland cement concrete, 30 feet wide, has been awarded to Jahn & Bressi. Grading of this section has just been completed by Le Tourneau & Lindberg. The new location is on greatly improved alignment and eliminates Saugus, Newhall and the Newhall tunnel from the Ridge Route. This section is 8.6 miles long.

LOS ANGELES-VENTURA COUNTIES

A contract for oil mix shoulders between Calabasas and Conejo Summit has been awarded to the Southwest Paving Company. It is expected that this contract will be finished in April.

MENDOCINO COUNTY

The contract for placing a 4-inch thickness of crushed gravel surfacing on portions of the Redwood Highway between a point 2 miles south of Arnold and the Sherwood-Laytonville road is progressing very satisfactorily through the contractors, Hemstreet and Bell.

Had not heavy rain storms and snow hampered the work, production would have no doubt been further advanced than at the present time.

MONO COUNTY

Between Mattly Ranch and Leevining, C. S. Miles is the contractor for the construction of 2.2 miles of standard graded roadbed 24 feet wide, with a 20-foot crushed rock base with a three-quarter-inch armor coat surface. On account of winter weather, the placing of the armor coat has been postponed until next June.

The work of remodeling blind curves, by widening on the Sherwin Hill, 20 miles north of Bishop is rapidly nearing completion.

Surveys and plans have been completed on proposed improvements between Sonora Junction and Coleville in northern Mono County.

This project traverses the canyon of the west branch of the Walker River, a popular recreational area for nature lovers from Nevada and northern California. A very considerable interest is manifested by the public in this improvement which plays an important part in interstate connections. Besides being the nucleus of extensive improvements to the south in Mono County this project is linked with contracts under way by the Bureau of Public Roads, Coleville to the California state line and on into Nevada. The state of Nevada has been exceedingly active in road improvements through the Carson Valley, via Carson City, Minden, Gardnerville and on to Mono County, California, which, together with the work described in the foregoing is providing ready and pleasurable access from the north to the open spaces "East of the High Sierras."

VENTURA COUNTY

A contract for second story paving with asphaltic concrete from Conejo Creek to Camarillo has been awarded to Griffith Company. It is expected that this work will be completed by next June.

YOLO COUNTY

The construction of Portland cement concrete pavement on line change at Mullen crossing is practically complete. The work is being done under contract by C. W. Wood of Stockton.

The state highway between Bretona and Dunnigan will be improved next season under contract by J. E. Johnston. The work will consist of placing bituminous surface on existing pavement and constructing rock borders.

YUBA COUNTY

Bituminous macadam surfacing and rock borders were constructed on that portion of the state highway between Dry Creek and Morrison's crossing under contract by J. E. Johnston.

GENERAL

Maintenance operations have been confined principally to slide removal, slide prevention and snow removal during the last month. Maintenance crews, however, have been able to keep the roads open for most of the time with but very little delay to the traveling public.

California leads the states in airports with 143. Texas next with 100, according to the Department of Commerce.

In a country newspaper appeared the following advertisement:

"The man who picked up my wallet in Fore street was recognized. He is requested to return it."

The next day this reply was published:

"The recognized man who picked up your wallet requests the loser to call at any time and collect it."

Record of Bids and Awards

HIGHWAY BID OPENINGS AND AWARDS

January 2 to 29, inclusive

IMPERIAL COUNTY—Myers Creek Bridge to 3 miles west of Coyote Wells, grading and paving with Portland cement concrete 2.9 miles. Dist. VIII, Rt. 12, Sec. A. Yglesios Bros., Inc., San Diego, \$162,180; V. R. Dennis Const. Co., San Diego, \$149,009; George Herz & Co., San Bernardino, \$138,127; Watson & Sutton, San Diego, \$135,826. Contract awarded to Basich Brothers, Los Angeles, \$121,148.90.

IMPERIAL COUNTY—Between El Centro and Holtville, 9 miles to be graded and paved with Portland cement concrete. Dist. VIII, Rt. 27, Sec. C. J. F. Knapp, Oakland, \$296,254; T. M. Morgan, Los Angeles, \$313,456; Basich Bros. Const. Co., Los Angeles, \$286,391; Jahn and Bressi Const. Co., Los Angeles, \$291,815; Wells and Bressler, Santa Ana, \$322,785; Sander Pearson, Santa Monica, \$285,506; Watson & Sutton, San Diego, \$317,013. Contract awarded to A. M. Peck Co., Los Angeles, \$264,955.35.

KERN COUNTY—Between the westerly boundary and Junction Pumping Station, grading and surfacing with bituminous macadam 15.5 miles. Dist. VI, Rt. 33, Sec. A. Hartman Construction Co., Bakersfield, \$312,698; J. E. Johnston, Stockton, \$281,452; Isbell Construction Co., Fresno, \$315,334; V. R. Dennis Construction, San Diego, \$311,228; Clyde W. Wood, Stockton, \$378,591; Lord & Bishop, Oroville, \$327,762; Jack Casson, Hayward, \$360,217; Skells & Graham, Roseville, \$311,271; M. J. Bevenda, Stockton, \$339,168; Gibbons & Reed Co., Burbank, \$340,540; Wells & Bressler, Santa Ana, \$338,746; C. R. Johnson, Portland, \$288,539; A. Teichert & Son, Sacramento, \$299,150. Contract awarded to Valley Paving & Construction, Visalia, \$264,655.25.

KERN COUNTY—Between San Emigdio Road and Main Valley road, 9.7 miles to be graded and surfaced with oil-treated crushed gravel or stone. Dist. VI, Rt. 57, Sec. C. J. E. Johnston, Stockton, \$161,275; A. Teichert and Son, Sacramento, \$141,189; S. J. Hales, Santa Ana, \$140,134; Tieslaus Bros., Berkeley, \$127,439; C. R. Johnson, Portland, \$131,764; Hartman Construction Co., Bakersfield, \$134,127; Isbell Construction, Fresno, \$153,964; G. W. Ellis, Los Angeles, \$130,943. Contract awarded to V. R. Denis Construction Company, San Diego, \$126,455.

LOS ANGELES COUNTY—At Liberty Grade about 5 miles west of Calabasas, 1.2 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 2, Sec. C. McCray Company, Los Angeles, \$87,335; Jahn and Bressi Construction, Los Angeles, \$95,395; Gist & Bell, Arcadia, \$85,821; Schelling Co., Burbank, \$97,546; The Callahan Construction, Los Angeles, \$94,997; Sander Pearson, Santa Maria, \$75,725; Gibbons and Reed, Burbank, \$92,985; Bruce Bros., Inc., Huntington Beach, \$79,909; Basich Brothers Construction, Los Angeles, \$73,449. Contract awarded to Will F. Peck Co., Los Angeles, \$69,953.45.

LOS ANGELES COUNTY—Between 2½ and 4 miles north of La Canada, 1.5 miles to be graded (heavy excavations). Dist. VII, Rt. 61, Sec. A. Sharp & Fellows Contracting, Los Angeles, \$407,868; Geo. Pollock Co., Sacramento, \$350,987; W. H.

Hauser, Oakland, \$321,519; The Utah Construction Co., San Francisco, \$386,478; Gist & Bell, Arcadia, \$319,270; M. S. Ross, Los Angeles, \$290,653; J. G. Donoyan & Son, Los Angeles, \$331,975; Nevada Contracting Co., Fallon, Nevada, \$293,266; Jahn & Bressi Construction Co., Los Angeles, \$379,746; Macco Construction, Clear Water, \$376,840; H. W. Rohl Co., Los Angeles, \$275,177. Contract awarded to T. M. Morgan Paving Co., Los Angeles, \$272,790.50.

RIVERSIDE COUNTY—At Wineville subway, 0.5 of mile of approaches to be paved with Portland cement concrete. Dist. VIII, Rt. 19, Sec. A, George Herz & Co., San Bernardino, \$43,687. Contract awarded to Matich Bros., Elsinore, \$42,552.50.

SAN LUIS OBISPO COUNTY—Between Santa Maria River and Los Berros Creek, 7.2 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. F, McCray Co., Los Angeles, \$309,078; Matich Bros., Elsinore, \$325,020; T. M. Morgan Paving Co., Los Angeles, \$303,692; Sander Pearson, Santa Monica, \$325,908; Peninsula Paving Co., San Francisco, \$289,732; C. R. Johnson, Portland, \$319,431; Basich Bros. Construction, Los Angeles, \$292,861; Valley Paving Construction, Visalia, \$358,448; C. W. Wood, Stockton, \$288,371; A. J. Raisch, San Jose, \$312,011; V. R. Dennis Construction, San Diego, \$371,205; Cornwall Construction, Santa Barbara, \$293,599; M. J. Bevanda, Stockton, \$317,084; Jahn & Bressi Construction, Los Angeles, \$299,791. Contract awarded to J. F. Knapp, Oakland, \$272,648.05.

SAN MATEO COUNTY—San Mateo to Redwood City, 7.3 miles grading Bayshore Highway. Dist. IV, Rt. 68, Sec. C, MacDonald & Kahn, San Francisco, \$466,338; Gist & Bell, Arcadia, \$471,955; Marsh Brothers & Gardinier, Inc., San Francisco, \$504,462; H. W. Rohl Co., Los Angeles, \$411,194; Standard Dredging Co., Oakland, \$466,094; Guy F. Atkinson Co., San Francisco, \$514,388; Granfield, Farrar & Carlin, San Francisco, \$506,717; C. R. Johnson, Portland, \$525,202; George Pollock Co., Sacramento, \$466,812; The Utah Construction, San Francisco, \$502,138. Contract awarded to Frederickson & Watson and Frederickson Bros., Oakland, \$406,145.20.

SANTA BARBARA COUNTY—Between Zaca and Wigmore, 4 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. C, W. A. Dontanville, Salinas, \$184,147; Matich Bros., Elsinore, \$189,472; Central Construction Co., Oakland, \$220,309; McCray Company, Los Angeles, \$172,592; T. M. Morgan Paving Co., Los Angeles, \$164,154; Sander Pearson, Santa Monica, \$181,929; C. R. Johnson, Portland, \$172,664; J. F. Knapp, Oakland, \$157,292; M. J. Bevanda, Stockton, \$221,000; C. W. Wood, Stockton, \$170,650; A. J. Raisch, San Jose, \$184,082; Basich Bros. Construction Co., Los Angeles, \$165,470. Contract awarded to Cornwall Construction Company, Santa Barbara, \$153,239.50.

SANTA CLARA COUNTY—Between San Francisco Creek and San Antonio Ave., main Coast Route, grading and paving with asphaltic concrete, 4.4 miles. Dist. IV, Rt. 2, Sec. A, C. W. Wood, Stockton, \$286,660; N. M. Ball, Porterville, \$297,027; Peninsula Paving Co., San Francisco, \$280,001; A. J. Raisch, San Jose, \$281,764. Contract awarded to Hanrahan Company, San Francisco, \$264,926.95.

SISKIYOU COUNTY—Yreka to Klamath River, grading and surfacing with untreated crushed gravel or stone, 7 miles. Dist. II, Rt. 3, Sec. C, Guy F. Atkinson, San Francisco, \$583,445; Nevada Contracting Co., Fallon, Nevada, \$590,636; T. M. Morgan Paving Co., Gazelle, \$613,574; Barsh Bros. and Gardinier, Inc., San Francisco, \$600,275; H. E. Doering, Port-

land, \$616,129; C. R. Johnson, Portland, \$580,787; The Utah Const. Co., San Francisco, \$667,841; Ward Engineering Co., San Francisco, \$681,664; Kern & Kibbe, San Francisco, \$582,757; A. C. Greenwood, Portland, \$619,087. Contract awarded to Wren & Greenough, Portland, \$571,626.25.

SOLANO COUNTY—Through Dixon, realignment of main route, eliminating two dangerous grade crossings, grading and paving 0.7 of a mile with Portland cement concrete. Dist. X, Rt. 7, Sec. E, Frederickson and Watson, Oakland, \$30,606. Contract awarded to C. W. Wood, Stockton, \$27,974.80.

TULARE COUNTY—Between Pixley and Tipton, 8.6 miles to be graded and paved with asphalt concrete. Dist. VI, Rt. 4, Secs. A and B, Valley Paving and Construction, Visalia, \$244,175; A Teichert & Son, Inc., Sacramento, \$247,054; Hanrahan Company, San Francisco, \$285,480. Contract awarded to California Construction Co., San Francisco, \$240,109.60.

AWARD OF CONTRACTS DIVISION OF ARCHITECTURE January 2 to January 30, 1930

AGNEWS STATE HOSPITAL, for drilling water well, contract awarded to J. Fred Holthouse of Santa Clara; price \$8,150.

SAN DIEGO STATE TEACHERS COLLEGE, for general work, training school and power house; awarded to H. Mayson of Long Beach; price \$137,645. Another contract for heating, ventilating and plumbing work on the above, awarded to Thomas Haverty Company of Los Angeles; price \$20,433. A third contract for electrical work on the above awarded to Moore Electric Company of Los Angeles; price \$6,245. Contract for installation of new return tubular boilers, above college, awarded to R. G. Meyler Corporation of Los Angeles; price \$10,300.

SAN FRANCISCO STATE TEACHERS COLLEGE, for grading play field areas; awarded to Sibley Grading & Teaming Co., Ltd., San Francisco; price \$7,490.

PACIFIC COLONY, for construction of roads in and about grounds, awarded to Pearson & Dickerson of Riverside; price \$3,000.

DAM APPROVALS APPLICATIONS AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1930.

LOS ANGELES COUNTY—Dry Canyon Dam No. 6-5. City of Los Angeles, Los Angeles, owner; earthfill, 54½ feet above streambed with a storage capacity of 657 acre-feet. Situated on Dry Canyon Creek in Sec. 35, T. 5 N., R. 16 W., S. B. M., for storage purposes for municipal use. Estimated cost \$127,000.

LOS ANGELES COUNTY—Fairmont Dam No. 6-8. City of Los Angeles, Los Angeles, owner; earthfill, 1112 feet above streambed with a storage capacity of 7487 acre-feet. Situated in Sec. 12, T. 7 N., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$627,560.

LOS ANGELES COUNTY—Lower Franklin Dam No. 6-14. City of Los Angeles, Los Angeles, owner; earthfill, 96 feet above streambed with a storage

capacity of 1652 acre-feet. Situated in Sec. 12, T. 1 S., R. 15 W., S. B. M., for storage and diversion purposes for municipal use. Estimated cost \$238,136.

LOS ANGELES COUNTY—South Haiwee No. 6-24A. City of Los Angeles, Los Angeles, owner; earthfill, 81 feet above streambed with a storage capacity of 60,000 acre-feet. Situated in Sec. 2, T. 21 S., R. 37 E., M. D. M., for storage purposes for municipal use. Estimated cost \$355,000.

LOS ANGELES COUNTY—North Haiwee Dam No. 6-24B. City of Los Angeles, Los Angeles, owner; earthfill, 26 feet above streambed with a storage capacity of 60,000 acre-feet. Situated in Sec. 3, T. 20 S., R. 37 E., M. D. M., for storage purposes for municipal use. Estimated cost \$65,800.

LOS ANGELES COUNTY—Upper Franklin Dam No. 6-27. City of Los Angeles, Los Angeles, owner; earthfill, 50 feet above streambed with a storage capacity of 123 acre-feet. Situated in Sec. 36, T. 1 N., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$28,647.

MENDOCINO COUNTY—Albion River No. 381. Albion Lumber Co., Albion, owner; timber and rock-fill, 9.5 feet above streambed with a storage capacity of 150 acre-feet.

MODOC COUNTY—Dannhauser Dam No. 161. Webber & Moffit, Alturas, owners; earth, 53 feet above streambed with a storage capacity of 350 acre-feet. Situated on ditch tributary to Yankee Jim Slough, in Sec. 8, T. 41 N., R. 13 E., M. D. M., for storage purposes for irrigation use.

MODOC COUNTY—Upper Pasture No. 161-2. Webber & Moffit, Alturas, owners; earth, 11 feet above streambed with a storage capacity of 250 acre-feet. Situated on Yankee Jim Slough, in Sec. 3, T. 42 N., R. 13 E., M. D. M., for storage purposes for irrigation use.

LASSEN COUNTY—Fleming No. 241. J. J. Fleming & Co., Wendel, Lassen Co., owners; earth and rock, 10 feet above streambed with a storage capacity of 79.8 acre-feet. Situated on unnamed creek tributary to Ash Creek in Sec. 6, T. 37 N., R. 11 E., M. D. M., for storage purposes for irrigation and domestic use.

SAN BENITO COUNTY—Pacheco Reservoir No. 652. San Benito Land & Water Co., Hollister, owner; earth, 20 feet above streambed with a storage capacity of 4500 acre-feet, tributary to San Benito and Tres Pinos creeks for storage purposes for irrigation use.

LOS ANGELES COUNTY—Highland Dam No. 6-12. City of Los Angeles, Los Angeles, owner; earthfill, with a storage capacity of 61.3 acre-feet.

LOS ANGELES COUNTY—Ascot Dam No. 6. City of Los Angeles, Los Angeles, owner; earth, 53 feet above streambed with a storage capacity of 219 acre-feet. Situated in T. 15 N., R. 13 W., S. B. M., for storage purposes for municipal use. Estimated cost \$102,497.

LOS ANGELES COUNTY—Pacoima Dam No. 32-8. Los Angeles County Flood Control Dist., Los Angeles, owner; arch, 340 feet, above streambed with a storage capacity of 11,925 acre-feet. Situated on Pacoima Creek tributary to Los Angeles River, in Sec. 19, T. 3 N., R. 14 W., M. D. M., for storage purposes for flood control use. Estimated cost \$2,514,770.

SAN MATEO COUNTY—Dumbarton Bridge No. 1 No. 616. Dumbarton Bridge Co., San Francisco, owner; earth, 18 feet above streambed. Situated on Ravenswood Slough, tributary to San Francisco Bay, in Sec. 24, T. 5 S., R. 3 W., M. D. M.

MODOC COUNTY—"G" (Bottle Cr.) No. 145. G. O. Transzettel, Alturas, owner; earth and rock, 8 feet above streambed. Situated in Secs. 27 and 28, T. 45 N., R. 10 E., M. D. M., for storage purposes for irrigation and stock use.

MODOC COUNTY—"C" (Antelope) No. 145-2. G. O. Transzettel, Alturas, owner; earth and rock, 20 feet above streambed. Situated in Sec. 13, T. 44 N., R. 10 E., M. D. M., for storage purposes for stock and irrigation use.

MODOC COUNTY—"M" No. 145-3. G. O. Transzettel, Alturas, owner; earth and rock, 10 feet above streambed. Situated in Sec. 19, T. 44 N., R. 9 E., M. D. M., for storage purposes for domestic and irrigation use.

MODOC COUNTY—"N" No. 145-4. G. O. Transzettel, Alturas, owner; earth and rock, 10 feet above streambed. Situated in Sec. 25, T. 25 N., R. 9 E., M. D. M., for storage purposes for domestic and irrigation use.

MODOC COUNTY—Fairchild (F) 145-5. G. O. Transzettel, Alturas, owner; earth and rock, 20 feet above streambed. Situated in Sec. 13, T. 43 N., R.

9 E., M. D. M., for storage purposes for domestic and irrigation use.

KERN COUNTY—Lake of the Woods Dam No. 733. J. D. and Florence Cuddy, Lebec, owners. Situated in Sec. 33, T. 9 N., R. 20 W., S. B. M.

LOS ANGELES COUNTY—Ivanhoe No. 6-13. City of Los Angeles, Los Angeles, owner; earth, 26 feet above streambed with a storage capacity of 147.5 acre-feet. Situated in Sec. 3, T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use.

LOS ANGELES COUNTY—Elysian Dam No. 6-6. City of Los Angeles, Los Angeles, owner; earth fill, 33 feet above streambed with a storage capacity of 32.1 acre-feet. Situated in T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use.

LOS ANGELES COUNTY—Encino No. 6-7. City of Los Angeles, Los Angeles, owner; earth, 99 feet above streambed with a storage capacity of 3229 acre-feet. Situated on Encino Creek tributary to Los Angeles River in T. 1 N., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$341,075.

LASSEN COUNTY—Spoooner Dam No. 241-2. J. J. Fleming & Co., Wendel, owners; earth and rock, 11 feet above streambed with a storage capacity of 312.8 acre-feet. Situated on Unnamed Canyon tributary to Ash Creek in Sec. 30, T. 37 N., R. 12 E., M. D. M., for storage purposes for domestic and irrigation use.

YUBA COUNTY—Bullards Bar Dam No. 97. Pacific Gas & Electric Co., San Francisco, owner; arch, 175 feet above streambed with a storage capacity of 35,000 acre-feet. Situated on North Fork of Yuba River, tributary to Yuba River, in Sec. 24, T. 38 N., R. 8 E., M. D. M., for storage purposes for power, mining and debris use. Estimated cost \$821,900.

NEVADA COUNTY—Blue Lake Dam No. 97-12. Pacific Gas & Electric Co., San Francisco, owner; earth and rock, 19 feet above streambed with a storage capacity of 1123 acre-feet. Situated on branch of Rucker Creek tributary to So. Fork Yuba River in Sec. 9, T. 17 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$6,834.

NEVADA AND PLACER COUNTIES—Drum Afterbay Dam No. 97-19. Pacific Gas & Electric Co., San Francisco, owner; arch, 7 feet above streambed with a storage capacity of 275 acre-feet. Situated on Bear River tributary to Feather River in Sec. 17, T. 16 N., R. 11 E., M. D. M., for regulation purposes for power use. Estimated cost \$199,455.

PLACER COUNTY—Drum Forebay Dam No. 97-20. Pacific Gas & Electric Co., San Francisco, owner; earth, 49 feet above streambed with a storage capacity of 44 acre-feet. Situated on Drum Canal in Sec. 16, T. 16 N., R. 14 E., M. D. M., for regulation purposes for power use. Estimated cost \$380,219.

NEVADA COUNTY—Fuller Lake Dam No. 97-21. Pacific Gas & Electric Co., San Francisco, owner; earth, 27 feet above streambed with a storage capacity of 1194 acre-feet. Situated on Jordan Creek tributary to South Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$8,893.

PLACER COUNTY—Kidd Lake Dam No. 97-25. Pacific Gas & Electric Co., San Francisco, owner; earth, 29.5 feet above streambed with a storage capacity of 149.2 acre-feet. Situated on unnamed creek tributary to South Fork Yuba River located in Sec. 29, T. 17 N., R. 14 E., M. D. M., for storage purposes for power use. Estimated cost \$49,010.

NEVADA COUNTY—Lake Fordyce Dam No. 97-28. Pacific Gas & Electric Co., San Francisco, owner; rock, 121 feet above streambed with a storage capacity of 46,662 acre-feet. Situated on Fordyce Creek, tributary to So. Fork Yuba River located in Sec. 34, T. 18 N., R. 13 E., M. D. M., for storage purposes for power use. Estimated cost \$1,870,390.

NEVADA COUNTY—Lake Spaulding Dam No. 97-29. Pacific Gas & Electric Co., San Francisco, owner; arch, 26 feet above streambed with a storage capacity of 74,488 acre-feet. Situated on South Yuba River tributary to Yuba River located in Sec. 20, T. 17 N., R. 12 E., M. D. M., for storage and diversion purposes for power use. Estimated cost \$2,353,676.

NEVADA COUNTY—Lower Feeley L. Dam No. 97-35. Pacific Gas & Electric Co., San Francisco, owner; earth, 10.8 feet above streambed with a storage capacity of 115 acre-feet. Situated on Branch of Fall Creek tributary to South Fork Yuba River in Sec. 29, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$1,075.

NEVADA COUNTY—Lower Lindsey Lake Dam No. 97-36. Pacific Gas & Electric Co., San Francisco, owner; earth, 8 feet above streambed with a storage

capacity of 252 acre-feet. Situated on Branch of Texas Creek tributary to South Fork of Yuba River in Sec. 20, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$2,193.

NEVADA COUNTY—Lower Rock Lake Dam No. 97-38. Pacific Gas & Electric Co., San Francisco, owner; earth and rock, 3½ feet above streambed with a storage capacity of 31 acre-feet. Situated on Branch of Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$374.

NEVADA COUNTY—Meadow Lake Dam No. 97-40. Pacific Gas & Electric Co., San Francisco, owner; earthen, 30 feet above streambed with a storage capacity of 4700 acre-feet. Situated on a stream tributary to Fordyce Creek in Sec. 27, T. 18 N., R. 13 E., M. D. M., for storage purposes, for power use. Estimated cost \$110,305.

NEVADA COUNTY—Middle Lindsey Lake Dam No. 97-41. Pacific Gas & Electric Co., San Francisco, owner; earth, 6 feet above streambed with a storage capacity of 138 acre-feet. Situated on Branch of Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$811.

NEVADA COUNTY—Rucker Lake Dam No. 97-44. Pacific Gas & Electric Co., San Francisco, owner; earth and rock, 14½ feet above streambed with a storage capacity of 552 acre-feet. Situated on Rucker Creek, tributary to South Fork Yuba River in Sec. 8, T. 17 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$5,176.

NEVADA COUNTY—Upper Feeley Lake Dam No. 97-45. Pacific Gas & Electric Co., San Francisco, owner; earth, 16 feet above streambed with a storage capacity of 907 acre-feet. Situated on Branch of Fall Creek, tributary to South Fork Yuba River in Sec. 28, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$2,606.

NEVADA COUNTY—Upper Lindsey Lake Dam No. 97-46. Pacific Gas & Electric Co., San Francisco, owner; earth, 5.6 feet above streambed with a storage capacity of 20 acre-feet. Situated on Branch of Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$150.

PLACER COUNTY—Upper Peak Lake Dam No. 97-47. Pacific Gas & Electric Co., San Francisco, owner; earth, 33 feet above streambed with a storage capacity of 1607 acre-feet. Situated on Unnamed Creek tributary to South Fork Yuba River in Sec. 32, T. 17 N., R. 14 E., M. D. M., for storage purposes for power use. Estimated cost \$26,530.

NEVADA COUNTY—Upper Rock Lake Dam No. 97-48. Pacific Gas & Electric Co., San Francisco, owner; earth, 13.5 feet above streambed with a storage capacity of 207 acre-feet. Situated on Unnamed Creek tributary to South Fork Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$2,224.

NEVADA COUNTY—White Rock Lake Dam No. 97-49. Pacific Gas & Electric Co., San Francisco, owner; earth, 10.5 feet above streambed with a storage capacity of 578 acre-feet. Situated on a Branch of North Creek tributary to Fordyce Creek, in Sec. 22, T. 18 N., R. 15 E., M. D. M., for storage purposes for power use. Estimated cost \$11,185.

CONTRA COSTA COUNTY—St. Mary's Dam No. 584. St. Mary's College, Oakland, owner; earth, 25 feet above streambed with a storage capacity of 400 acre-feet. Situated on Las Trompas Creek tributary to Walnut Creek in Sec. 17, T. 1 S., R. 2 W., M. D. M., for storage and diversion purposes for irrigation and recreational use. Estimated cost \$100,000.

SAN DIEGO COUNTY—Barrett Dam No. 8. City of San Diego, San Diego, owner; gravity arch, 161 feet above streambed with a storage capacity of 42,899 acre-feet situated on Cottonwood Creek tributary to Pita Juana River in Sec. 22, T. 17 S., R. 2 E., S. B. M., for storage purposes for municipal use. Estimated cost \$1,650,000.

SAN DIEGO COUNTY—Chollas Dam No. 8-2. City of San Diego, San Diego, owner; earth, 58 feet above streambed with a storage capacity of 278 acre-feet situated on Branch of Chollas Creek tributary to San Diego Bay in Sec. 35, T. 16 S., R. 2 W., S. B. M., for equalizing purposes for municipal use. Estimated cost \$31,000.

SAN DIEGO COUNTY—Lake Hodges Dam No. 8-3. City of San Diego, San Diego, owner; multiple arch, 115 feet above streambed with a storage capacity of 65,000 acre-feet. Situated on San Dieguito River tributary to Pacific Ocean in Sec. 18, T. 13 S., R. 2 W., S. B. M., for storage purposes for municipal use. Estimated cost \$500,000.

SAN DIEGO COUNTY—Lower Otay Dam No. 8-4. City of San Diego, San Diego, owner; gravity arch, 137.5 feet above streambed with a storage capacity of 49,126 acre-feet. Situated on Otay River tributary to San Diego Bay in Secs. 18 and 13, T. 13 S., R. 1 E., and 1 W., S. B. M., for storage purposes for municipal use. Estimated cost \$744,828.

SAN DIEGO COUNTY—San Dieguito Dam No. 8-6. City of San Diego, San Diego, owner; multiple arch, 50 feet above streambed with a storage capacity of 128 acre-feet. Situated on Branch of Escondido Creek tributary to Pacific Ocean, for equalizing purposes for municipal use. Estimated cost \$50,000.

SAN DIEGO COUNTY—Upper Otay No. 8-8. City of San Diego, San Diego, owner; arch, 72 feet above streambed with a storage capacity of 2793 acre-feet, situated on Proctor Valley Creek tributary to Otay River in Sec. 36, T. 17 S., R. 1 W., S. B. M., for storage purposes for municipal use. Estimated cost \$50,000.

LOS ANGELES COUNTY—Bellevue Dam No. 6-3. City of Los Angeles, Los Angeles, owner; earth, 44 feet above streambed with a storage capacity of 106.8 acre-feet situated in Sec. 18, T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use. Estimated cost \$77,135.69.

LOS ANGELES COUNTY—Buena Vista Dam No. 6-2. City of Los Angeles, Los Angeles, owner; earth, 21.5 feet above streambed with a storage capacity of 40 acre-feet situated in T. 1 S., R. 13 W., S. B. M., for municipal use.

LOS ANGELES COUNTY—Rowena Dam No. 6-18. City of Los Angeles, Los Angeles, owner; earth, 15 feet above streambed with a storage capacity of 94.22 acre-feet situated in Sec. 5, T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use. Estimated cost \$57,549.70.

LASSEN COUNTY—Goodrich Diversion Dam No. 237-2. Red River Lumber Co., Westwood, owner; earth, 6 feet above streambed with a storage capacity of 60 acre-feet situated on Hamilton Branch tributary to Feather River, in Sec. 33, T. 29 N., R. 9 E., M. D. M., for diversion purposes for irrigation and industrial use. Estimated cost \$11,000.

LASSEN COUNTY—Westwood Mill Pond No. 237-3. Red River Lumber Co., Westwood, owner; earth, 13.5 feet above streambed with a storage capacity of 488 acre-feet situated on Rogers Creek tributary to Feather River in Sec. 8, T. 28 N., R. 9 E., M. D. M., for storage purposes for logging use. Estimated cost \$35,000.

LASSEN COUNTY—Piute Creek Dam No. 237-4. Red River Lumber Co., Westwood, owner; earth, 48 feet above streambed with a storage capacity of 126 acre-feet situated on Piute Creek tributary to Susan River in Sec. 27, T. 30 N., R. 11 E., M. D. M. Estimated cost \$16,000.

MODOC COUNTY—Plum Canyon Dam No. 139. Mrs. Lester H. Porter and John Page, Adams, owners; earth, 14 feet above streambed with a storage capacity of 125 acre-feet situated on Plum Canyon tributary to Parker Creek in Sec. 32, T. 42 N., R. 13 E., M. D. M., for storage purposes for irrigation and stock use. Estimated cost \$600.

EL DORADO COUNTY—Patterson Dam No. 466. C. A. Patterson, Placerville, owner; earth and rock, 9 feet above streambed with a storage capacity of 10 acre-feet for storage purposes for irrigation use.

BUTTE COUNTY—Phillbrook Dam No. 97-8. Pacific Gas & Electric Co., San Francisco, owner; earth, 63 feet above streambed with a storage capacity of 4375 acre-feet situated on Phillbrook Creek tributary to West Branch of North Fork of Feather River in Sec. 13, T. 25 N., R. 4 E., M. D. M., for storage purposes for power use. Estimated cost \$266,240.

PLACER COUNTY—Christian Valley Dam No. 97-15. Pacific Gas & Electric Co., San Francisco, owner; rock, 28 feet above streambed with a storage capacity of 111 acre-feet situated on South Fork of Dry Creek tributary to Feather River in Sec. 26, T. 13 N., R. 8 E., M. D. M., for regulation purposes for power use. Estimated cost \$57,325.

PLACER COUNTY—Halsey Forebay No. 97-23. Pacific Gas & Electric Co., San Francisco, owner; earth, 20 feet above streambed with a storage capacity of 285 acre-feet situated on unnamed water course tributary to Dry Creek in Sec. 13, T. 13 N., R. 8 E., M. D. M., for regulation purposes for power use. Estimated cost \$168,860.

PLACER COUNTY—Rock Creek Dam No. 97-43. Pacific Gas & Electric Co., San Francisco, owner; multiple arch, 30 feet above streambed with a storage capacity of 550 acre-feet situated on Rock Creek tributary to Feather River in Sec. 28, T. 13 N., R. 8 E., M. D. M., for regulation purposes for power use. Estimated cost \$144,750.

ALPINE COUNTY—Lower Blue Lake No. 97-62. Pacific Gas & Electric Co., San Francisco, owner; crib, 43.3 feet above streambed with a storage capacity of 4130 acre-feet situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 30, T. 9 N., R. 19 E., M. D. M., for storage purposes for power use. Estimated cost \$127,137.

ALPINE COUNTY—Meadow Lake No. 97-63. Pacific Gas & Electric Co., San Francisco, owner; rock, 69.5 feet above streambed with a storage capacity of 6110 acre-feet situated on Unnamed Stream tributary to North Fork Mokelumne River in Sec. 27, T. 9 N., R. 18 E., M. D. M., for storage purposes for power use. Estimated cost \$172,413.

ALPINE COUNTY—Twin Lakes No. 97-69. Pacific Gas & Electric Co., San Francisco, owner; earth, 17.3 feet above streambed with a storage capacity of 1425 acre-feet situated on Unnamed Stream tributary to North Fork Mokelumne River in Sec. 25, T. 9 N., R. 18 E., M. D. M., for storage purposes for power use. Estimated cost \$20,171.

ALPINE COUNTY—Upper Blue Lake Dam No. 97-70. Pacific Gas & Electric Co., San Francisco, owner; rock, 25.6 feet above streambed with a storage capacity of 7200 acre-feet situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 18, T. 9 N., R. 19 E., M. D. M., for storage purposes for power use. Estimated cost \$41,124.

TUOLUMNE COUNTY—Herring Creek No. 97-71. Pacific Gas & Electric Co., San Francisco, owner; crib, 12 feet above streambed with a storage capacity of 100 acre-feet situated on Herring Creek tributary to South Fork Stanislaus River in Sec. 30, T. 5 N., R. 19 E., M. D. M., for storage purposes for power use. Estimated cost \$5,886.

SHASTA COUNTY—Pit No. 3 (Lake Britton) Dam No. 97-98. Pacific Gas & Electric Co., San Francisco, owner; gravity, 102 feet above streambed with a storage capacity of 32,200 acre-feet situated on Pit River tributary to Sacramento River in Sec. 30, T. 37 N., R. 3 E., M. D. M., for storage purposes for power use. Estimated cost \$1,450,905.

SHASTA COUNTY—Pit No. 1, Diversion Dam No. 97-99. Pacific Gas & Electric Co., San Francisco, owner; concrete, 10 feet above streambed situated on Fall River tributary to Pit River, in Sec. 25, T. 37 N., R. 4 E., M. D. M., for diversion purposes for power use. Estimated cost \$140,091.

SHASTA COUNTY—Pit No. 4, Dam 97-100. Pacific Gas & Electric Co., San Francisco, owner; gravity, 43 feet above streambed with a storage capacity of 2000 acre-feet situated on Pit River tributary to Sacramento River, in Sec. 8, T. 36 N., R. 2 E., M. D. M., for diversion purposes for power use. Estimated cost \$1,233,117.

MONO COUNTY—Forebay Dam No. 536-2. Mono Mining Co., Wellington, Nevada, owner; crib, 40 feet above streambed with a storage capacity of 30 acre-feet situated on Green Creek tributary to East Walker River in Sec. 4, T. 3 N., R. 25 E., M. D. M., for storage purposes for power use. Estimated cost \$18,287.

MONO COUNTY—East Lake Dam No. 536. Mono Mining Co., Wellington, Nevada, owner; rock crib, 15 feet above streambed with a storage capacity of 1087.3 acre-feet situated on Green Creek tributary to E. Walker River in Sec. 26, T. 3 N., R. 24 E., M. D. M., for storage purposes for power use. Estimated cost \$4,046.

MONO COUNTY—Green Lake Dam No. 536-3. Mono Mining Co., Wellington, Nevada, owner; crib, 12 feet above streambed with a storage capacity of 4,058 acre-feet situated on Green Creek tributary to East Walker River in Sec. 22, T. 3 N., R. 24 E., M. D. M., for storage purposes for power use. Estimated cost \$1,974.

ORANGE COUNTY—Yorba Dam No. 791. Anaheim Union Water Co., Anaheim, owner; earth, 50 feet above streambed with a storage capacity of 2000 acre-feet, situated in Sec. 27, T. 3 S., R. 9 W., S. B. M., for storage purposes for irrigation use. Estimated cost \$53,188.88.

MENDOCINO COUNTY—Morris Dam No. 92. Wilhits Water Co., Wilhits, owner; arch, 52.5 feet above streambed with a storage capacity of 835 acre-feet, situated on Jones Creek tributary to Bel River in Sec. 33, T. 17 N., R. 13 W., M. D. M., for storage purposes for domestic use. Estimated cost \$65,500.

LOS ANGELES COUNTY—Sierra Madre Dam No. 32-13. Los Angeles Co. Flood Control Dist., Los Angeles, owner; arch 65 feet above streambed with a storage capacity of 62.5 acre-feet. Situated on Little Santa Anita Creek tributary to Santa Anita Creek, in Sec. 16, T. 1 N., R. 11 W., S. B. M., for storage purposes for municipal use. Estimated cost \$70,000.

MODOC COUNTY—Roberts No. 1 Dam No. 157. H. M. Roberts, Lookout, owner; earth, 2 feet above streambed with a storage capacity of 933 acre-feet. Situated on Antelope drainage tributary to Pit River in Sec. 29, T. 40 N., R. 7 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$2,000.

MODOC COUNTY—Old Roberts Dam No. 157-2. H. M. Roberts, Lookout, owner; earth, 3 feet above streambed with a storage capacity of 3970 acre-feet. Tributary to Pit River in Sec. 11, T. 39 N., R. 7 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$4,000.

INYO COUNTY—Hillside Dam No. 100. Hillside Water Co., Riverside, owner; rock, 77 feet above streambed with a storage capacity of 14,000 acre-feet. Situated on South Fork of Bishop Creek tributary to Owens River in Sec. 15, T. 9 S., R. 31 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$325,595.

INYO COUNTY—Reservoir No. 1 Sabrina Dam No. 101. Nevada-California Power Co., Riverside, owner; rock, 70 feet above streambed with a storage capacity of 7500 acre-feet. Situated on Middle Fork Bishop Creek tributary to Owens River in Sec. 31, T. 8 S., R. 31 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$257,219.

INYO COUNTY—Bishop Cr. Intake No. 2 No. 101-2. Nevada-California Power Co., Riverside, owner; rock, 29 feet above streambed with a storage capacity of 115 acre-feet. Situated on Middle Fork of Bishop Creek tributary to Owens River in Sec. 16, T. 8 S., R. 31 E., M. D. M., for regulation purposes for power use. Estimated cost \$62,174.

INYO COUNTY—Bishop Cr. Intake No. 3 No. 101-3. Nevada-California Power Co., Riverside, owner; concrete, 16 feet above streambed with a storage capacity of 2.3 acre-feet. Situated on Bishop Creek tributary to Owens River in Sec. 9, T. 8 S., R. 31 E., M. D. M., for diversion purposes for power use. Estimated cost \$39,564.

INYO COUNTY—Bishop Cr. Intake No. 4 No. 101-4. Nevada-California Power Co., Riverside, owner; concrete, 23 feet above streambed with a storage capacity of 14½ acre-feet. Situated on Bishop Creek tributary to Owens River in Sec. 36, T. 7 S., R. 31 E., M. D. M., for diversion purposes for power use. Estimated cost \$51,840.

MONO COUNTY—Rush Creek Meadows Dam No. 101-5. Nevada-California Power Co., Riverside, owner; arch, 47 feet above streambed with a storage capacity of 490 acre-feet. Situated on Rush Creek tributary to Mono Lake in Sec. 14 T. 2 S., R. 25 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$188,967.

MONO COUNTY—Lundy Lake Dam No. 101-6. Nevada-California Power Co., Riverside, owner; earth and rock, 40 feet above streambed with a storage capacity of 3320 acre-feet. Situated on Mill Creek tributary to Mono Lake in Sec. 16, T. 2 N., R. 25 E., M. D. M., for storage and diversion purposes for power and irrigation use. Estimated cost \$178,266.

MONO COUNTY—Bishop Creek Intake No. 5 No. 102. Southern Sierras Power Co., Riverside, owner; concrete, 19 feet above streambed with a storage capacity of 4 acre-feet. Situated on Bishop Creek tributary to Owens River in Sec. 19, T. 7 S., R. 32 E., M. D. M., for diversion purposes for power use. Estimated cost \$21,734.

MONO COUNTY—Gem Lake Dam No. 103. Cain Irrigation District, Riverside, owner; multiple arch, 72 feet above streambed with a storage capacity of 17,604 acre-feet. Situated on Rush Creek tributary to Mono Lake in Sec. 30, T. 2 S., R. 26 E., M. D. M., for storage purposes for power use. Estimated cost \$795,941.

MONO COUNTY—Agnew Lake Dam No. 103-2. Cain Irrigation Dist., Riverside, owner; multiple arch, 27 feet above streambed with a storage capacity of 851 acre-feet. Situated on Rush Creek tributary to Mono Lake in Sec. 20, T. 2 S., R. 26 E., M. D. M., for storage purposes for power use. Estimated cost \$39,400.

MONO COUNTY—Grant Lake Dam No. 103-3. Cain Irrigation District, Riverside, owner; rock, 20 feet above streambed with a storage capacity of 10,111 acre-feet. Situated on Rush Creek tributary to Mono Lake in Sec. 16, T. 1 S., R. 26 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$64,726.

MONO COUNTY—Saddlebag Dam No. 103-4. Cain Irrigation Dist., Riverside, owner; rock, 30 feet above streambed with a storage capacity of 11,138 acre-feet. Situated on Leavine Creek tributary to Mono Lake in Sec. 12, T. 1 N., R. 24 E., M. D. M., for storage purposes for power use.

poses for irrigation and power use. Estimated cost \$257,117.

MONO COUNTY—Tioga Lake Dam No. 103-5. Cain Irrigation Dist., Riverside, owner; rock, 11 feet above streambed with a storage capacity of 1386 acre-feet. Situated on Leevining Creek tributary to Mono Lake in Sec. 19, T. 1 N., R. 25 E., M. D. M., for storage purposes for irrigation and power use. Estimated cost \$51,092.

MONO COUNTY—Rhinedollar Lake Dam No. 102-6. Cain Irrigation Dist., Riverside, owner; rock, 12 feet above streambed with a storage capacity of 745 acre-feet. Situated on Leevining Creek tributary to Mono Lake in Sec. 20, T. 1 N., R. 25 E., M. D. M., for storage purposes for irrigation and power use. Estimated cost \$176,125.

LASSEN COUNTY—Buckhorn Dam No. 238. First Nat'l. Bank of Reno, Reno, Nevada, owner. Located in Sec. 32, T. 35 N., R. 17 E.

LASSEN COUNTY—Cariban Lake No. 234. J. A. Bennett, Chico, owner; earth, 12 feet above streambed. Situated on Cariban Lake tributary to Susan River in Sec. 34, T. 31 N., R. 7 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1,000.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1930.

EL DORADO COUNTY—Rock Creek Dam No. 465. Arthur E. Risor, Georgetown, owner; earth, 30 feet above streambed with a storage capacity of 34.2 acre-feet. Situated on Rock Creek tributary to South Fork American River in Sec. 34, T. 13 N., R. 1 E., M. D. M., for storage and diversion purposes for domestic, irrigation, mining and recreational use. Estimated cost \$2,000.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1930.

LOS ANGELES COUNTY—Chatsworth Dam No. 6-4A. City of Los Angeles, Los Angeles, owner; earth/lin. Situated on Chatsworth Foothills tributary to Los Angeles River.

LASSEN COUNTY—Spooners Dam No. 241-2. J. J. Fleming & Co., Wendel, owner; earth and rock. Situated on Unnamed Canyon tributary to Ash Creek in Sec. 30, T. 37 N., R. 12 E., M. D. M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of January, 1930.

LOS ANGELES COUNTY—Hansen Dam No. 32-6. Los Angeles Co. Flood Control District, Los Angeles, owner; arch, 150 feet above streambed with a storage capacity of 1250 acre-feet. Situated on Big Thunja Creek tributary to Los Angeles River in Sec. 1, T. 2 N., R. 13 W., S. B. M., for flood control purposes for municipal use.

MODOC COUNTY—Pickering Pond Dam No. 144. Pickering Lumber Co., Alturas, owner; earth, 22 feet above streambed with a storage capacity of 500 acre-feet. Situated in Sec. 16, T. 42 N., R. 12 E., M. D. M., for storage purposes for logging use. Estimated cost \$22,194.29.

MENDOCINO COUNTY—Ridge-wood Dam No. 382. Charles S. Howard Co., San Francisco, owner; earth, 31 feet above streambed with a storage capacity of 334 acre-feet. Situated on Forsyth Creek tributary to Russian River in Sec. 18, T. 17 N., R. 13 W., M. D. M., for storage purposes for irrigation use. Estimated cost \$25,188.25.

SAN DIEGO COUNTY—Crouch Dam No. 839. Charles S. Crouch, San Diego, owner; earth, 40 feet above streambed with a storage capacity of 40.7 acre-feet. Situated on Unnamed Canyon tributary to Las Chollas Creek in Sec. 3, T. 17 S., R. 2 W., S. B. M., for storage purposes for domestic use. Estimated cost \$9,631.

MERCED COUNTY—Merced Falls Dam No. 95-10. San Joaquin Light & Power Co., Fresno, owner;

gravity, 34 feet above streambed with a storage capacity of 620 acre-feet. Situated on Merced River tributary to San Joaquin River in Sec. 4, T. 5 S., R. 15 E., M. D. M., for diversion purposes for power and logging use. Estimated cost of enlargement \$50,000.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of January, 1930.

LOS ANGELES COUNTY—Chatsworth Dam No. 6-4A. City of Los Angeles, Los Angeles, owner. Earth blanket.

BUTTE COUNTY—Concow Dam No. 67. Thermaito Irrigation District and Table Mountain Irrigation District, Oroville, owner; arch. Situated on Concow Creek tributary to W. Branch Feather River in Sec. 16, T. 22 N., R. 4 E., M. D. M. Nature of repairs—lining area below spillway. Estimated cost \$3,600.

LASSEN COUNTY—Spooners Dam No. 241-2. J. J. Fleming & Co., Wendel, owner; earth and rock, situated on Unnamed Canyon tributary to Ash Creek in Sec. 30, T. 37 N., R. 12 E., M. D. M. Nature of alterations—new spillway.

WATER APPLICATIONS AND PERMITS

Applications for Permit to Appropriate Water Filed with the State Department of Public Works, Division of Water Resources, during January, 1930.

VENTURA COUNTY—Application No. 6521. George D. Hantgin, Peter K. Hantzis and Edward Rudolph Schroff, c/o Sheridan, Orr, Drapeau & Gardner, Attys., First National Bank Bldg., Ventura, Cal., for 1 c.f.s. from unnamed spring tributary to San Buenaventura River. To be diverted in Sec. 26, T. 5 N., R. 23 W., S. B. M. for irrigation and domestic purposes. Estimated cost \$2,500.

SAN JOAQUIN COUNTY—Application 6522. Linden Irrigation District, c/o A. L. Cowell, Bank of America Bldg., Stockton, Cal., for 100,000 acre-feet per annum from Calaveras River tributary to San Joaquin River. To be diverted in Sec. 5, T. 2 N., R. 9 E., M. D. M., for irrigation and domestic purposes.

LASSEN COUNTY—Application 6523. Antone Ayilla, Bieber, Cal., for 4200 acre-feet per annum from Juniper River tributary to Pit River. To be diverted in Sec. 3, T. 36 N., R. 8 E., M. D. M., for irrigation purposes. Estimated cost \$10,000.

HUMBOLDT COUNTY—Application 6524. F. A. Leach and Fred D. Smith, Fortuna, Cal., for 0.54 c.f.s. from Eel River tributary to Pacific Ocean. To be diverted in Sec. 24, T. 1 N., R. 1 E., H. M. for irrigation purposes. Estimated cost \$200.

RIVERSIDE COUNTY—Application 6525. F. Wm. Seggie, Star Route, Riverside, Cal., for 7100 g.p.d. from Butterfly Canyon Spring (underground water also to be developed) tributary to San Jacinto River. To be diverted in Sec. 31, T. 3 S., R. 1 W., S. B. M., for domestic and irrigation purposes. Estimated cost \$200.

SAN JOAQUIN COUNTY—Application 6526. Millard C. and Charles A. Johnson, Rt. 1, Box 162, Escalon, San Joaquin Co., Cal., for 2 c.f.s. from Lone Tree Creek tributary to San Joaquin River. To be diverted in Sec. 21, T. 1 S., R. 8 E., M. D. M., for agricultural purposes. Estimated cost \$2,000.

SUTTER COUNTY—Application 6527. T. J. Cummins Ranch Co., c/o Lucius R. Bates, Box 148, Sacramento, Cal., for 5.98 c.f.s. from Sacramento

River tributary to Suisun Bay. To be diverted in Sec. 21, T. 12 N., R. 1 E., M. D. M., for irrigation purposes. Estimated cost \$7,000.

MONO COUNTY—Application 6528. Newton M. Otis, 200 Juniper Bldg., Santa Monica, Cal., for 300 g.p.d. from unnamed spring tributary to Mammoth Creek and Owens River. To be diverted in Sec. 9, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$75.

PLACER COUNTY—Application 6529. Nevada Irrigation District, c/o Wm. Durbrow, Mgr., Grass Valley, Cal., for 10 c.f.s. from Auburn Ravine. To be diverted in Sec. 13, T. 12 N., R. 6 E., M. D. M.

SAN JOAQUIN COUNTY—Application 6530. Smith-Riddell Company, Inc., Lodi, Cal., for 11.8 c.f.s. from Upland Canal tributary to Sycamore Slough. To be diverted in Sec. 10, T. 3 N., R. 5 E., M. D. M. Estimated cost \$13,500.

HUMBOLDT COUNTY—Application 6531. Edgar Lee Wight, 435 Buchanan St., San Francisco, Cal., for 2 c.f.s. from Cinder Cap Spring tributary to Buluff Creek. To be diverted in Sec. 12, T. 10 N., R. 4 E., H. M., for power purposes. Estimated cost \$1,500.

INYO COUNTY—Application 6532. H. W. White, Independence, Cal., for 1 g.p.m. from unnamed spring. To be diverted in Sec. 10, T. 13 S., R. 34 E., M. D. M., for mining and domestic purposes. Estimated cost \$10.

SUTTER COUNTY—Application 6533. A. M. Donaboe by A. H. Lydon, Mgr. and Agent, c/o Lawrence Schilling, Yuba City, Cal., for 1 c.f.s. from Feather River tributary to Sacramento River. To be diverted in Sec. 14, T. 14 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$2,500.

SIERRA COUNTY—Application 6534. Washoe County Water Conservation Dist., c/o King & Malone, Engineers and Contractors, for 50,000 acre-feet per annum from Little Truckee River tributary to Truckee River. To be diverted in Sec. 4, T. 18 N., R. 17 E., M. D. M., for irrigation and domestic purposes.

LAKE COUNTY—Application 6535. Martin Judge, Jr. and Company, Crocker First National Bank, San Francisco, Cal., for 175,000 acre-feet per annum from North Fork of Cache Creek tributary to Cache Creek. To be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation purposes. Estimated cost \$1,000,000.

LAKE COUNTY—Application 6536. Martin Judge, Jr. and Company, Crocker First National Bank, San Francisco, Cal., for 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cache Creek. To be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

MONO COUNTY—Application 6537. U. S. Inyo National Forest, Dept. of Agriculture, San Francisco, Cal., for 1000 g.p.d. from creek between Lake Mamie and Twin Lakes tributary to Mammoth Creek and Owens River. To be diverted in Sec. 9, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$152.

MONO COUNTY—Application 6538. U. S. Inyo National Forest, Dept. of Agriculture, San Francisco, Cal., for 8200 g.p.d. from Coldwater Creek tributary to Mammoth Creek and Owens River. To be diverted in Sec. 16, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$460.

SAN JOAQUIN COUNTY—Application 6539. H. R. Russell, 426 Hackberry St., Modesto, Cal., for 3 c.f.s. from drainage through natural depression and drainage of waste ditch of Oakdale Irrigation District tributary to Little John Creek. To be diverted

in Sec. 17, T. 1 S., R. 9 E., M. D. M., for irrigation purposes.

PLACER COUNTY—Application 6540. Mrs. Eva Harness and R. Langley, Loomis, Cal., for 0.26 c.f.s. from Secret Ravine tributary to Antelope Creek. To be diverted in Sec. 10, T. 11 N., R. 7 E., M. D. M. Estimated cost \$850.

TUOLUMNE COUNTY—Application 6541. Joseph Brown, Chinese Camp, Cal., for 0.025 c.f.s. from Smarts Gulch tributary to Woods Creek and Tuolumne River. To be diverted in Sec. 18, T. 1 S., R. 15 E., M. D. M. Estimated cost \$555.

PLACER AND NEVADA COUNTIES—Application 6542. Bear River Water and Power Co., c/o J. L. Rollins, Colfax, Cal., for 110,020 acre-feet per annum from Bear River and its tributaries tributary to Feather River. To be diverted in Sec. 22, T. 15 N., R. 9 E., M. D. M., for power purposes. Estimated cost \$2,500,000.

YUBA COUNTY—Application 6543. Wallace James Sanford, c/o Rich & Weis, Attyrs., Hart Bldg., Marysville, Cal., for 1 c.f.s. from Dry Creek tributary to Bear River. To be diverted in Sec. 34, T. 15 N., R. 6 E., M. D. M., for irrigation and stock watering purposes. Estimated cost \$3,500.

MENDOCINO COUNTY—Application 6544. Robert B. Finn, c/o Thos. W. Firby, 827 Mills Bldg., San Francisco, Cal., for 0.025 c.f.s. from unnamed creek tributary to Eel River. To be diverted in Sec. 21, T. 19 N., R. 12 W., M. D. M., for domestic purposes. Estimated cost \$450.

TUOLUMNE AND ALPINE COUNTIES—Application 6545. Emma Rose and Hobart Estates Co., operating as Utica Mining Co., c/o A. C. Wilson, 1508 Balfour Bldg., San Francisco, Cal., for 10,800 acre-feet per annum from Highland Creek tributary to N. Fork of Stanislaus River. To be diverted in Sec. 9, T. 6 N., R. 18 E., M. D. M., for power purposes.

YOLO COUNTY—Application 6546. Karl Brehme, 1202 Hobart Bldg., San Francisco, Cal., for 200 c.f.s. and 200,000 acre-feet per annum from Putah-Pope-Capell-Etiwera creeks tributary to Sacramento River. To be diverted in Sec. 25, T. 8 N., R. 2 W., M. D. M.

Permits to Appropriate Water, Issued by the Department of Public Works, Division of Water Resources, during January, 1930.

SAN DIEGO COUNTY—Permit 3421. Application 6255. Issued to Palomar Estates, Ltd., Long Beach, Cal., January 8, 1930, for 1.25 c.f.s. from Nigger Creek in Sec. 11, T. 10 S., R. 1 W., S. B. M., for domestic use. Estimated cost \$10,000.

SAN DIEGO COUNTY—Permit 3422. Application 6256. Issued to Palomar Estates, Ltd., Long Beach, January 8, 1930, for 3.62 c.f.s. from Pauma Creek in Sec. 3, T. 10 S., R. 1 W., S. B. M., for irrigation use on 917.5 acres. Estimated cost \$115,000.

SISKIYOU COUNTY—Permit 3423. Application 6427. Issued to Frank L. Cunningham, Happy Camp, Cal., January 9, 1930, for 3 c.f.s. from Oak Flat Creek in Sec. 32, T. 16 N., R. 7 E., H. M., for power purposes. Estimated cost \$5,000.

SIERRA COUNTY—Permit 3424. Application 6428. Issued to Marie E. Phelan, Sierra City, January 10, 1930, for 3 c.f.s. from Slug Canyon in Sec. 2, T. 19 N., R. 10 E., M. D. M., for mining use. Estimated cost \$1,000.

VENTURA COUNTY—Permit 3425. Application 6452. Issued to Reginaldo Ruiz, Ojai, Cal., January 13, 1930, for 300 gallons per day from Two Unnamed

Springs in Secs. 6 and 7, T. 6 N., R. 23 W., S. B. M., for domestic use. Estimated cost \$1,000.

LOS ANGELES COUNTY—Permit 3426, Application 6375. Issued to H. H. Townsend, Beverly Hills, Cal., January 14, 1930, for 0.001 c.f.s. from Upright Spring in Sec. 19, T. 6 N., R. 17 W., S. B. M., for irrigation use on 60 acres.

EL DORADO COUNTY—Permit 3427, Application 6244. Issued to H. L. Fowlar, Georgetown, Cal., January 17, 1930, for 3 c.f.s. from Little Otter Creek in Sec. 27, T. 13 N., R. 11 E., M. D. M., for mining use. Estimated cost \$1,000.

INYO COUNTY—Permit 3428, Application 6466. Issued to American Potash and Chemical Corp., Trona, Cal., January 17, 1930, for 0.0544 c.f.s. from Christmas Spring in Sec. 26, T. 24 S., R. 42 E., M. D. M., for industrial and domestic use. Estimated cost \$4,840.

DEL NORTE COUNTY—Permit 3429, Application 6126. Issued to Aller Placer Mines Takilma, Oregon, January 22, 1930, for 3 c.f.s. from East Fork of East Fork, Illinois River, in Sec. 34, T. 19 N., R. 5 E., H. M., for placer mining. Estimated cost \$6,000.

SISKIYOU COUNTY—Permit 3430, Application 6292. Issued to Longrey Mining & Milling Company, Goltville, Cal., January 22, 1930, for 0.75 c.f.s. from Longrey Creek in Sec. 22, T. 47 N., R. 8 W., M. D. M., for mining and domestic purposes. Estimated cost \$500.

MENDOCINO COUNTY—Permit 3431, Application 6464. Issued to Thomas S. Van Vleet, Turlock, Cal., January 25, 1930, for 0.45 c.f.s. from West Branch Russian River, in Sec. 32, T. 17 N., R. 12 W., M. D. M., for use for irrigation on 36.44 acres. Estimated cost \$1,000.

SAN JOAQUIN COUNTY—Permit 3432, Application 6379. Issued to Charley Jensen, Manteca, Cal., January 25, 1930, for 3.49 c.f.s. from unnamed channel in Sec. 6, T. 1 S., R. 9 E., M. D. M., for irrigation use on 279.3 acres. Estimated cost \$4,000.

HUMBOLDT COUNTY—Permit 3433, Application 6172. Issued to Trinity Loop Mining Co., San Francisco, Cal., January 27, 1930, for 20 c.f.s. from Cedar Creek in Sec. 9, T. 6 N., R. 6 E., H. M., for mining use. Estimated cost \$3,000.

TRINITY COUNTY—Permit 3434, Application 6192. Issued to Trinity Loop Mining Co., San Francisco, Cal., January 27, 1930, for 10 c.f.s. from Hawkins Creek, in Sec. 9, T. 6 N., R. 6 E., H. M., for mining use. Estimated cost \$10,000.

HUMBOLDT COUNTY—Permit 3435, Application 6208. Issued to Trinity Loop Mining Co., San Francisco, Cal., January 27, 1930, for 10 c.f.s. from Grove Prairie Creek in Sec. 9, T. 6 N., R. 6 E., H. M., for mining use. Estimated cost \$10,000.

HUMBOLDT COUNTY—Permit 3436, Application 6326. Issued to Trinity Loop Mining Co., San Francisco, Cal., January 27, 1930, for 15 c.f.s. from Horse Range Creek in Sec. 9, T. 6 N., R. 6 E., H. M., for mining use. Estimated cost \$8,000.

Policeman Judge, this man is arrested for gambling and being drunk and driving a car while soused.

Drunk—Your Honor, "Man's inhumanity to man makes countless thousands mourn." I'm not as debased as Swift, as profligate as Byron, as dissipated as Poe, or as debauched as—

Judge—That will do. Thirty days; and officer, take a list of those names and run them in; they're as bad as he is.

Snow Removal Service Commended

WESTWOOD AUTO CLUB

Westwood, California

February 6, 1930.

Mr. H. S. Comly, District Engineer,
State Division of Highways,
Redding, California.

Dear Mr. Comly:

It is with a feeling of pride, for the admirable engineering ability and energy that has been displayed in our district of the California Highway System, on the Snow Removal Program, that this letter is written.

We particularly refer to the Red Bluff-Susanville Highway. This highway has been kept open in such a manner as to make it possible to pass other cars at practically all points at all times with the least inconvenience and to maintain a speed that was very nearly summer schedule. This has been done consistently throughout all storm periods this winter and has afforded the people of northern California, Nevada and states further east to continue an uninterrupted exchange of traffic throughout this period and no doubt the majority of this travel has been towards the milder climate of California.

We appreciate fully that the clearing of this highway has been done with engineering precision, as to the proper and sufficient and adequate equipment, manned by men who could and did labor under the most trying and adverse conditions and happy to say it worked perfectly. Your Maintenance Engineer, Mr. E. J. Gribble is due credit for carrying your plans and program to a successful conclusion. This work has not been done without costs but we believe that the amount expended is commensurate with the good it has done and feel safe in saying that it has been a good investment for California and a great boon to the people.

The members of the Westwood Auto Club feel very grateful for your interest in this problem that has afforded them so much relief and pleasure through the long winter months that heretofore we have been denied motor travel.

With kindest personal regards to you from the club,

WESTWOOD AUTO CLUB,

(Signed) H. GARFIELD OATES.

Suburban Schoolmam: "Rastus, get a bucket of water."

Rastus: "I ain't agwine to do it."

Suburban Schoolmam: "Now, Rastus, you know that is not the way to say anything. Repeat this after me—

"I am not going to do it,

"Thou are not going to do it.

"He is not going to do it.

"We are not going to do it.

"You are not going to do it.

"They are not going to do it.

"Now, Rastus, what would you say?"

Rastus: "They ain't nobody agwine to do it."

Most of the funny columns have already called attention to the difference the lambs in Wall street have found between gambling and gambling.

STATE OF CALIFORNIA

Department of Public Works

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B. B. MEEK-----Director

CORNING DE SAULES-----Deputy Director

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M. B. HARRIS, Commissioner, Patterson Bldg., Fresno
JOSEPH M. SCHENCK, Commissioner, c/o United Artists Studio, Santa Monica Blvd., Los Angeles
FRED S. MOODY, Commissioner, 640 Kohl Bldg., San Francisco

C. H. PURCELL, State Highway Engineer, Sacramento
GEORGE C. MANSFIELD, Secretary
HARRY A. ENCELL, Attorney, San Francisco

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C. S. POPE, Construction Engineer
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CHAS. E. ANDREW, Bridge Engineer
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EUGENE W. BISCALUZ, Superintendent of California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

Port of Eureka—F. E. Barnum, Supervisor
Port of San Jose—Not appointed
Port of San Diego—Edgar A. Luce

PRIMARY ROADS 13 NORTHERN COUNTIES

Rte. Terminal

- 1 San Joaquin to Oregon Line via Smith River
- 2 San Francisco to N. Line S. L. O. Co.
- 3 Sacramento to Oregon Line
- 4 Sacramento to N. Line Tulare to
- 5 San Joaquin to Santa Clara via Hayward and comes from the Coast
- 6 From Sacramento to Woodland Junction
- 7 From Fresno to Fresno Junction
- 8 Fresno to Colusa via Napa
- 9 Hanford to W. Line Tulare to
- 10 Sacramento to Placerville
- 11 Santa to Sonoma
- 12 Albany to Marysville
- 13 Williams to Colusa
- 14 Hanford to Lodi
- 15 Hanford to Lodi
- 16 Merced to Yosemite National Park
- 17 Redding to Weaverville
- 18 From Route 1 via Oroville to Quincy
- 19 San Joaquin to Hanford to Hanford
- 20 N. Line Mono Co. to Marysville
- 21 Route 4 near Lodi to San Andreas
- 22 Nevada City to Hanford
- 23 Redding to Hanford
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- 25 Route 4 near Lodi to San Andreas
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SECONDARY ROADS 13 NORTHERN COUNTIES

Rte. Terminal

- 1 San Joaquin to Oregon Line via Smith River
- 2 San Francisco to N. Line S. L. O. Co.
- 3 Sacramento to Oregon Line
- 4 Sacramento to N. Line Tulare to
- 5 San Joaquin to Santa Clara via Hayward and comes from the Coast
- 6 From Sacramento to Woodland Junction
- 7 From Fresno to Fresno Junction
- 8 Fresno to Colusa via Napa
- 9 Hanford to W. Line Tulare to
- 10 Sacramento to Placerville
- 11 Santa to Sonoma
- 12 Albany to Marysville
- 13 Williams to Colusa
- 14 Hanford to Lodi
- 15 Hanford to Lodi
- 16 Merced to Yosemite National Park
- 17 Redding to Weaverville
- 18 From Route 1 via Oroville to Quincy
- 19 San Joaquin to Hanford to Hanford
- 20 N. Line Mono Co. to Marysville
- 21 Route 4 near Lodi to San Andreas
- 22 Nevada City to Hanford
- 23 Redding to Hanford
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- 25 Route 4 near Lodi to San Andreas
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PRIMARY ROADS 13 SOUTHERN COUNTIES

Rte. Terminal

- 1 N. Line S. L. O. Co. to San Diego
- 2 N. Line Tulare Co. to Los Angeles
- 3 San Francisco to San Bernardino
- 4 San Francisco to San Bernardino
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SECONDARY ROADS 13 SOUTHERN COUNTIES

Rte. Terminal

- 1 W. Boundary Mono Co. to Route 23
- 2 Paso Robles to Route 4 N. of Rakersfield
- 3 Yosemite Park to Route 23 at Mono Lake
- 4 San Bernardino to Los Angeles via Bear Lake
- 5 N. Line S. L. O. Co. to Colusa
- 6 Santa Maria to Fresno
- 7 Lancaster to Blythe
- 8 La Canada to Mt. Wilson Road via Arroyo
- 9 Arroyo to Pine Flat via San Gabriel
- 10 The Pine to Oxnard

LEGEND

Primary Roads

Secondary Roads

Division Northern and Southern Counties according to Breed Bill

74097 2-30 7300

California Highways and Public Works



ENTRANCE TO SCIENCE GROUP, SANTA BARBARA STATE TEACHERS COLLEGE

Official Journal of the Department of Public Works

MARCH

State of California

1930

MAR 31 1935



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Reducing the Hazard From Fires Starting Along State Highways

By T. H. DENNIS, Maintenance Engineer.

THE Division of Highways' Fire Hazard Reduction program was initiated early in 1928 by Mr. B. B. Meek, Director of the Department of Public Works. Prior to that time fire reduction along state highways was more or less incidental to the roadside grading.



T. H. DENNIS.

Initiation of the work was prompted by a keen appreciation of the potential menace that matured vegetation bordering the highways offered adjoining property, as well as the difficulty of fixing responsibility for roadside conflagrations caused by careless users of the roads.

During 1928 some 660 miles of highway roadside were cleared at a cost of \$37,850. The largest single operation consisted of clearing 29 miles of 80-foot right of way on the southernly portion of the Ridge Route.

The program this past year involved an expenditure of \$54,000 on 885 miles of roadside. The work extended along the Redwood Highway through Sonoma, Mendocino and Humboldt counties; the Pacific Highway, east and west of the Sacramento River to Redding; the Mother Lode Highway between Auburn and Sonora; the Mountain laterals, between Sacramento and Placerville, Clay and Jackson, Lodi and San Andreas; the All Year Highway, between Merced and Yosemite; as well as the Inland Coast laterals between Gilroy and Califa, San Lucas and Hanford, and Santa Maria and Maricopa. Hazards were also reduced along the coast and Inland Highways in San Luis Obispo, Santa Barbara, Ventura, Los Angeles, San Bernardino, and San Diego counties. This year's program now under way has been extended somewhat, and will involve the clearing of 1020 miles of roadway at a cost of \$76,750.

In the main this work has been confined to locations where the highways are bordered

by grain, grazing, or heavy brush areas. Various methods of eradication have been tried out. These included cultivation, mowing, spraying with oils and chemicals, and burning. Of these methods of control burning has been most effective, though considerable risk attends the work particularly when the adjacent fields are dry and inflammable. This risk has been overcome to a large extent by our present practice of spraying the roadsides early in the spring with 27°+ gravity Diesel oil.

The spraying last year was handled by five state-owned and four rented outfits. Each unit consisted of a 3½-ton truck, carrying a 1000-gallon tank. At the rear a platform supported a number 2 Trahern spiral gear centrifugal pump, powered by a 1½ h.p. engine. The oil was pumped through a ¾-inch hose, which supplied five orchard type sprays set in a 6-foot section of ¾-inch steel tubing. Oil was applied at a rate of from 1/10 to 1/6 gallon per square yard of surface treated.

The oil spray imparts a brownish-green color to the roadsides, and within a week's time the growth has withered and dried to the stage where it can be readily burned. This method, however, is too expensive for general application, as the cost per mile of treating a 9-foot area both sides of the roadway, exclusive of burning, is \$70 to \$115, respectively, for the 1/10 or 1/6 gallon application. This cost is based on Diesel oil at 4 cents per gallon, and its application at 2½ cents per gallon. Due to this high cost we limited the treatment last year to a 4½-foot area adjacent the fence lines, where the growth is heavy and particularly difficult to eradicate except by burning. This strip usually served as an effective fire break for the burning performed after the roadside growth was matured and dried up.

The progress was necessarily slow, as the spray was hand directed, and application thus limited to walking speed. The weight of the spray and hose imposed a considerable burden on the operator. During the past winter our Headquarters Equipment Department redesigned the spraying unit, resulting in greater progress and ease of application. This outfit consists of a trailer unit to be attached

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Weed spraying unit attached to 1000-pound truck.

to a tank truck. This trailer carries the pump unit, together with a telescopic outrigger arm, which supports a $\frac{1}{2}$ -inch rubber hose. The outlet end of the hose is attached to a 9-foot spray bar. The operator stands on a platform on the trailer and easily controls the position of the outrigger and raises or lowers the spray bar as required. A similar outrigger arrangement has been built for installation on the regular heavy oil spreader trailer units, and it is expected these units will give greater volume per day, because of the greater pump capacity. Our best progress in light hours with this unit is two 9-foot strips along 8 miles of roadway.

Portions of the work last year were contracted to carry out peak load, but the results were not entirely satisfactory. The contractor was interested mainly in the amount of oil spread, and made little effort to avoid spraying trees, shrubs, or even guard rails, which greatly increased the subsequent burning costs. We favor doing the work by contract, providing we can safeguard against such promiscuous spraying.

Burning costs have averaged between \$20 and \$30 per mile, depending on the amount of protective measures required. Considerable care is necessary in this phase of the work, as a slight change in wind might easily

blanket the highway with smoke, causing a grave hazard to traffic. To guard against this contingency, our men are instructed to control all traffic through the burning zone.

They are also instructed to secure the consent and aid of the owner before burning in front of his property. If this is refused, no burning is done, as we feel the work is primarily for the owner's benefit, and our men should not be obligated to assume his responsibility. In general, we do not expect to carry on this work after April 1.

This year we are carrying on extensive experiments with a nonpoisonous agent which is sprayed on the roadsides similar to the Diesel oil. The killing action is very similar to that of the oil, though it is claimed that burning is unnecessary, as the growth shrivels up and disappears. Claims are also made that after several yearly applications the ground becomes sterile and future growth is eliminated. Needless to say, we are very much interested



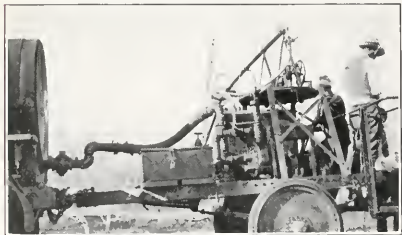
Spraying arm in working position.

in having this prove a success, as it eliminates burning, which greatly disfigures the roadsides.

The results of this work the past two years have been very encouraging, few if any, preventable fires starting along our highways. In this part of our work we have had the hearty cooperation of the Department of Natural Resources, Bureau of Forestry, also of several county organizations which had equipment available.

While this phase of hazard reduction is of particular interest to the grower and cattleman, there is yet another which presents a problem of state-wide interest. I refer to the protection of our state and national forests.

Early in 1924 a cooperative agreement was concluded with the U. S. Department of Agriculture, Forest Service, whereby the Division of Highways' employees were pledged to re-



A close-up view of the weed spraying unit.

Sending the Highway Patrol to School

By JAMES J. BORREE, Head of the Bureau of Schools and Education of California Highway Patrol.*

LEGISLATORS, police and traffic chiefs, and all others interested in the subject, have come to realize that any police or traffic force must be properly trained in its duties to meet modern requirements successfully.

To put a man in a uniform, pin a badge on him, give him a revolver and send him out



J. J. BORREE.

alone on a motorcycle to patrol the highways without preliminary training is fundamentally unsound. To train him adequately in his duties before he starts is practical and economical. Men can not serve efficiently, even though willingly, unless they know what they are doing and unless such knowledge has been fashioned into methods of work.

It is with this thought in mind that we have developed plans for the training schools for highway patrol officers, required by section 30 of the new motor vehicle act. The plan, as developed in its tentative stages, is twofold in scope:

1. Immediate establishment of schools in Los Angeles and Sacramento for two weeks of preliminary work to instruct new men to be added to the patrol at once. These new men are being added to carry out provisions of the act requiring the establishment of night patrols.

2. Later establishment of a permanent school at some convenient point where every officer in the patrol may ultimately undergo a three-months course of intensive training.

The course of instruction in the preliminary two-weeks schools will be curtailed of necessity because of lack of time. Its primary purpose will be to instruct the new men in the rudiments of patrol work so that they may not enter their new field altogether untrained. Later, the men getting this preliminary instruction will be required to finish their general traffic education in the general three-months training school. This, of course, can only be done gradually because of physical limitations and the necessity of leaving an adequate number of men on the highways at all times.

It is in this general three-months school that our major effort will be put. The tentative plan is to draw as many men as can be spared from each unit at one time to a central location, put them in charge of experienced instructors and under rigid discipline for the three-months period.

These men, or such as have passed successfully through this intensive training, will be returned to their squads and another contingent of men drawn and ordered to the school. It is not contemplated that the number of men in the school will exceed 60 at any one time.

In this manner it will be possible to train all the officers in the patrol in a period of about one year.

Inclusive of physical training and close order drill the work will require 402 hours of actual instruction. This, however, does not include night study periods.

The life at the schools will follow very closely the routine of barracks life in the regular army. First call will be at 6.30 a.m. with assembly 15 minutes later. There will be 30 minutes of physical drill and close order with breakfast at 7.30 o'clock.

* In this article J. J. Borree, head of the bureau of schools and education of the highway patrol, tells of plans being outlined for the highway patrol school for traffic officers. General Borree spent 27 years as an officer in the regular army, was eight years Adjutant General of California, now holds the rank of brigadier general in the regular army.

Classes will run from 8.30 to 11.30 a.m. and from 1 to 4 p.m.

There will be frequent study periods in the evenings from 7 to 9. Lights will be out at 10.30 p.m. and every man will be required to be in bed.

It will be seen from this daily schedule that the school will be a serious business with plenty of work and little time for play. Here is the outline of school courses:

Discipline, courtesy, physical drill and military close order, personal and official conduct, contact with public, 22 hours.

First aid, 25 hours; physical contact, 5 hours; target practice, 10 hours; motor care and equipment, 20 hours; court procedure, preserving and preparing evidence, arrests, prisoners, warrants, etc., 30 hours; geography, arithmetic and memory test, 10 hours.

Accidents, including evidence and investigations, preventative measures, safety studies, clearing highways, etc., 20 hours.

Administration, communications, reports, efficiency, 30 hours.

California Vehicle Act, brakes, lights, motor registrations, traffic violations, 158 hours.

The faculty of the school will include a commandant, a senior instructor, assistant senior instructor and five subordinate instructors. Attached to the staff will be a cook, a cook's assistant and three waiters and dishwashers.

In addition to the regular faculty, judges, district attorneys and others will lecture on court procedure and allied subjects at various times. The American Red Cross Society will give a 25-hour course in first aid without cost to the state while motorcycle and automotive agencies will detail experts to give instruction on care of equipment. Several members of the Highway Patrol Headquarters Staff will lecture on brakes, lights, weights, accidents and other subjects.

We feel reasonably certain, from the scope of the course of training, that every patrolman, after undergoing this three-months of instruction will be able to patrol the highways properly and intelligently, to enforce the Motor Vehicle Act and that such instruction will prove a large factor in making our highways safe to the traveling public.

It is our hope to teach the recruit the elements of professional courtesy and to teach every old officer that improvement of the service demands they not only maintain themselves in excellent physical condition but that they improve technique of their daily work constantly.

We hope to instill into the officers a sense

Where, How and What Of Accidents Along State Highways

A RECAPITULATION of accidents for the year October 1, 1928, to September 30, 1929, on the state highways of California brings out the following facts:

In 49.78 per cent, a collision between two cars was involved.

In 85.02 per cent, the driver's condition apparently normal.

In 81.36 per cent, passenger cars were involved.

38.07 per cent show no violation of road laws.

80.13 per cent occurred on straight roads.

56.93 per cent occurred at street intersections.

31.14 per cent involved pedestrians at crossings with no signals.

71.85 per cent involved pedestrians apparently in normal condition.

61.21 per cent occurred where the road surface was dry.

66.13 per cent occurred during clear weather.

49.69 per cent occurred in daylight.

Approximately 60 per cent of all accidents occur within the urban areas.

A Garden is a lovely thing, God wot.

Rose plot;

Fringed pool;

Ferned grot.

The veriest school of peace; and yet the fool
 Contends that God is naught!

—From Grayson's "Friendly Road."

of the dignity of their calling and the necessity of developing good will through courtesy. Strict discipline will be insisted upon because discipline produces courtesy, firmness and self respect.

Target practice will be given because firearms in the hands of the unskilled are almost as great a menace as in the hands of the criminally-minded. Instruction in jiu jitsu and physical contact will train our officers to cope with the criminal and first aid will teach them to give succor to victims of accidents.

The course of physical instruction will be such as to encourage the officers to continue it after leaving the school on the general theory that men enjoy life to a fuller degree when they feel fit.

Winter Traffic Count on State Highways

THE winter traffic count on state highways was taken January 12 and 13.

This count has been made on the Sunday and Monday nearest the middle of January and of July for the past six years. The check is made between the hours of 6 a.m. and 10 p.m. each day. For purposes of analysis the record is kept separate by hours. Vehicles are segregated under the following classifications: Passenger cars, light trucks, heavy trucks, trailers, buses and horse-drawn vehicles. Traffic was recorded at 921 separate stations during this count.

Traffic, as a whole, was much lighter than during the count of January, 1929. This is accounted for by the snow storm which occurred during the week end. Many miles of roads were covered with snow and only necessary through traffic was on the roads. During Sunday those who enjoyed snow sports were able to indulge their fun much nearer home than usual. Past records led us to expect a 9 per cent gain in traffic over that of the previous year. The actual figures, as compared with the 1929 count, indicate the effect of weather conditions.

	For Sunday per cent		For Monday per cent	
	Gain	Loss	Gain	Loss
Main north and south routes	21.9		2.6	
Laterals between inland and coast routes	5.3		11.3	
Interstate connections	17.4		1.0	
Recreational	44.7		5.3	
Average all routes	36.2		14.5	

As there are more motor vehicles registered now than one year ago, the reduction in business to those catering to the traveling public through decrease in traffic by over one-third, represents a large sum even for a single day.

The gain and loss in traffic, expressed as a percentage of the January, 1929, count for all State highway routes, is as follows:

Rt. No.	Description	Sunday gain per cent	Sunday loss per cent	Monday gain per cent	Monday loss per cent
1	Sausalito-Oregon Line	3.9		23.0	
2	San Francisco-San Diego		32.0	6.5	
3	Sacramento-Oregon Line		3.4		5.3
4	Sacramento-Los Angeles		13.6	6.4	
5	Stockton-Santa Cruz		12.3	14.6	
6	Sacramento-Woodland Jet		3.7	23.7	
7	Tehama Jet-Benicia		12.2		8.4
8	Ignacio-Cordella	1.7		20.9	
9	San Fernando-San Bernardino		2.1	2.2	
10	San Lucas-Sequola National Park	24.1		15.8	

Rt. No.	Description	Sunday gain per cent	Sunday loss per cent	Monday gain per cent	Monday loss per cent
11	Sacramento-Riverfront	17.6		25.6	
12	San Diego-El Centro	6.5		8.5	
13	Salida-Sonora		28.5		8.5
14	Albany-Martinez		12.3	4.7	
15	Rt. 1 near Calpella-Grass Valley		24.0		7.2
16	Hopland-Lakeport		40.9		43.9
17	Roseville-Nevada City	31.0			24.1
18	Merced-El Portal		37.8		16.6
19	Rt. 9 West of Claremont-River-side		27.3	9.3	
20	Redding to Rt. 1 near Arcata		26.6		49.7
21	Rt. 3 near Richvale-Quincy	13.1			8.1
22	San Juan Bautista-Rt. 32	45.5		13.7	
23	Saugus-Bishop		29.7		25.0
24	Rt. 4 near Lodi to Valley Springs		41.7		11.4
25	Nevada City-Downieville		87.8		77.1
26	San Bernardino-El Centro		3.5		3.5
27	El Centro-Yuma		8.5	10.4	
28	Redding-Nevada Line		8.6		54.0
29	Red Bluff-Nevada Line		50.2		27.4
30	Route abandoned				
31	San Bernardino-Jean	No count account snow			
32	Rt. 4 near Califa-Rt. 2 at Gilroy		1.4	24.7	
33	Rt. 4 near Bakersfield-Paso Robles	45.5		82.4	
34	Rt. 4 near Arno-Pine Grove		6.0	13.9	
35	Peanut-Kuntz		60.0		71.5
37	Auburn-Coffax	0.7		3.8	
38	Meyers-Nevada Line		52.9		64.8
39	Tahoe City-Nevada Line	Road closed account snow			
40	Rt. 13 near Montezuma-Rt. 23-Mono Lake		41.3		34.2
41	West and East of Hume	No count			
42	Saratoga Gap at Redwood Pk.	No count account snow			
43	San Bernardino-Rig Bear Lake	No count account snow			
44	Boulder Creek-Redwood Park		4.5	15.2	
45	Willows-Rt. 3 N. of Biggs		21.6		19.5
46	Rt. 1 near Klamath River-Rt. 3 near Cray		42.2		38.6
47	Orland-Chico		10.7		14.2
48	McDonalds-Wendling		10.3		7.2
49	Calistoga-Lower Lake	43.5			3.0
51	Santa Rosa-Schellville	11.5		10.0	
52	Alto-Tiburon		40.7		50.0
53	Fairfield-Lodi		21.9		3.0
54	Near Michigan Bar-Central House		29.4		26.2
55	San Francisco-Spring Valley Dam		16.7	33.6	
	S. of Carmel Interx. of Carmel Valley and Big Sur Roads		77.0		50.5
57	Santa Maria-Bodfish	17.3		21.6	
58	Mojave-Tonoe		32.2	3	
59	Lancaster-Baileys		45.2		15.1
60	El Rio-San Juan Capistrano		63.5		7.2
61	La Canada-Mt. Wilson Rd.	30.2		17.7	
63	Big Pine-Oasis		85.3		75.0
64	Mecca-Blythe		43.2		44.2
65	Auburn-Sonora		38.3		18.0
65	Mauntena-Rt. 5 nr. Mossdale School		4.9	23.7	
67	Pajaro R. Rt. 2 nr. San Benito River Bridge		20.4	10.7	
68	San Francisco-Burlingame	5.2		89.6	
69	San Quentin Road	12.2		20.3	
70	Ukiah Jet. Rt. 1		35.7		
71	Crescent City-Oregon Line		11.3		2.7
	Totals		36.2		14.5

TRAFFIC CENSUS

January 1929, and 1930

Count 6 a.m. to 10 p.m.

Route 1. Sausalito to Oregon Line

District IV

Station location	January, 1929 Sun.	January, 1929 Mon.	January, 1930 Sun.	January, 1930 Mon.
Sausalito to Ferry Building	485	275		
Sausalito-Hyde Street Ferry	3,638	1,444		

(Continued on page 25.)

How California Cares for the Blind

By P. T. POAGE, Assistant Architect.

THE CARE of the blind may be divided into three general classes, Educational, Industrial and Benevolent. The State of California has long recognized that proper education of the blind youth and training and employment of the adult blind in useful industrial occupations very largely reduces

the need for benevolence. In line with this policy it maintains two major institutions, the California School for the Blind in Berkeley and the Industrial Home for the Adult Blind in Oakland. During 1929 a beginning was made toward establishing in Los Angeles a second industrial institution



P. T. POAGE.

to serve the southern part of the state.

CALIFORNIA SCHOOL FOR THE BLIND

The California School for the Blind is maintained under the State Department of Education as an integral part of the state's educational system. Its history may be said to date back to 1860 with the organization in San Francisco of the "Society for the Instruction and Maintenance of the Deaf and Blind," which induced the state to erect a building for carrying out the purposes of the society at Fifteenth and Mission streets.

The Deaf, Dumb and Blind Asylum, as it became known, rapidly grew beyond the possibilities of the site and on the recommendations of a legislative committee a new site was selected in Berkeley and the cornerstone of a new building was laid there in 1867. A severe earthquake on October 21, 1868, caused serious damage to the building and loss to the contractor.

On January 17, 1875, fire totally destroyed the building and in the same year reconstruction commenced. That the new buildings which are still used by the School for the Deaf were then considered to be of the best construction, is indicated by a description by Mr. Warring Wilkinson, principal of the Asylum at the time:

"The construction of the buildings is of the most substantial character. Nothing has been sacrificed to show, but every regard has been paid to comfort, safety and durability. A massive, concrete sub-foundation of Portland cement underlies all the walls. The foundations are of stone, granite water table, and superstructure of plain brick, with granite sills, galvanized iron cornice, and slate roof. The partition walls throughout are of brick, interlaced and bonded strongly with iron. All the staircases are of stone, and a spiral stone staircase, at the extreme end of the sleeping apartments, renders it impossible for the children to be cut off should fire, by any chance, obtain possession of the middle portion. The exterior walls are lined, and the interior are built with hollow brick, and plastered without the use of lath or furring, so that there is no wooden communication between the different stories. The basement floor is laid three inches thick, with artificial stone. With all these precautions, it is difficult to see how fire can obtain lodgment, and, if it does, the loss will be confined to a single building, the distance between the different 'homes' being ninety feet."

The stigma of the name "Asylum" was removed in 1905 and the school became known as the California Institution for the Deaf and Blind. A still greater forward step was made in 1921 when the legislature divided the institution into two separate schools, the California School for the Deaf and the California School for the Blind.

With the separation, the School for the Blind was given a portion of the grounds on which have been built new buildings specially planned for the needs of the blind. With the assistance of Dr. R. S. French, able principal of the school, the Division of Architecture has planned and constructed the buildings which make possible the physical separation until it is now practically completed, and the standard of the school has been steadily raised to the point where the students are no longer considered as unfortunate wards of the state but as students in a part of the public school system which differs from the common schools only in the special methods of instruction required.

It is interesting to note the progress in institutional planning as illustrated by following the construction of this institution from its early days. First we have the congregate type of plan, of the original building in San Francisco and of the first development in Berkeley, in which all functions of the institution were provided for under one roof without due regard for their separation.

Then after the fire of 1875 we see the advancement to the cottage plan whereby living accommodations are furnished in dormitories entirely separated from administration and educational activities.

The last step, exemplified by the present school, has been the elimination, to a large degree, of the old institutional feeling by a further development of the cottage plan, keeping the dormitory buildings small and dividing the students into small groups within the buildings. Institutional feeding in one large dining room has also been eliminated.

The first unit of the new school was a dormitory for girls, for which funds were appropriated by the 1923 legislature. This building contains living quarters for approxi-

structed to provide a kindergarten room and rooms for vocational training such as basketry, weaving, piano tuning, general shop work, etc.

The complete separation of the blind from the deaf was permitted in 1929 with the completion of the boys' dormitory which is similar in general theory of plan to the girls' dormitory mentioned above. This building is somewhat rambling in plan, adapting itself freely to a hillside site and planned to permit entrance at ground level to both the first and second floors. Segregation is made in groups according to ages, with separate play rooms, and a common dining room with complete kitchen adjoining. Communication between the different floors is by means of ramps rather than stairs. This is a feature not pro-



BOYS' DORMITORY, CALIFORNIA SCHOOL FOR THE BLIND.

mately fifty girls, divided into groups of three or four, with a separate sleeping room for each group.

A large living room with a fireplace at the far end provides ample recreation space for the entire group. A completely equipped kitchen serves the dual purpose of feeding and of providing a practical laboratory for instruction in cooking as a part of the school curriculum. Classrooms are included in the building for instruction in sewing and other domestic arts.

In 1926, the second unit, the school building, was completed. In it are included general classrooms; special rooms for music, science and commercial work; the school library, the administration offices, and an auditorium equipped with a pipe organ. During the coming year an addition will be con-

vided in the other buildings, but considered very desirable.

The buildings are of fire-resistive construction, the walls and floors being of concrete and the roofs of clay tile. Free interpretations of Spanish and Italian motives, adapted to suit the requirements of modern planning, have given pleasing variation to the different units, still maintaining a complete harmony of the whole.

INDUSTRIAL HOME FOR THE ADULT BLIND

The state had long made provision for numerous classes of its unfortunate or defective citizens before attention was directed to the needs of the adult blind. Mining and other industries requiring the use of high explosives contributed largely to the number of adult blind until they became quite numerous and

demanded admission to the Asylum in Berkeley. The trustees of the Asylum resisted and their contention that it was established for scholastic and not industrial purposes was sustained by the courts.

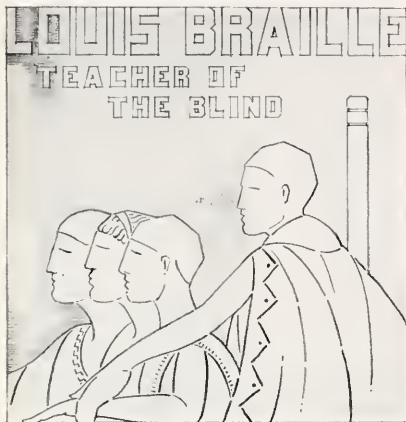
Adult Blind to be managed by the trustees of the deaf, dumb and blind asylum. A site of five acres at Thirty-sixth street and Telegraph avenue, Oakland, containing an 18-room house and two barns was leased with an option to buy, and a two-story shop was erected.

The dissimilarity of the problem of educating the blind youth and that of training, industrially, the adult was soon apparent and in 1887 the Home was established as an entirely independent institution. In the same year, money was appropriated for the purchase of the site and for the construction of a three-story wood frame dormitory, and a residence for the superintendent.

In 1909-1910 the State Engineering Department, forerunner of the Department of Public Works, took its first major part in the development of the institution in planning and building the first permanent building, containing dormitories for women, general kitchen and dining rooms, and the administrative offices. This and the men's dormitory which followed in 1914 were of fire-resistive construction providing needed safety for this type of inmate. These buildings followed the so-called "Mission" style so popular at the time.

No further permanent construction was undertaken until 1922-1923 when a dormitory

(Continued on page 34.)



Not to be discouraged so easily, the champions of the cause sought legislative action and in 1885 the legislature authorized the establishment of the Industrial Home for the



The two panels shown on this page are part of the wall decorations at the new Industrial Home for the Blind.

Standard Highway Specifications Revised

A REVISED edition of the Standard Specifications for highway and bridge construction is now being distributed among contractors, materialmen, and others interested in state highway work.

The 1930 specifications apply to work advertised on and after March 12, 1930. In line with the present custom, a proposal form will be issued for each job advertised, which will contain special provisions supplementing and amending the Standard Specifications to apply to each particular job.

For the convenience of contractors and engineers who are familiar with the 1929 edition, changes appearing in the revised edition dated January, 1930, are outlined below. This summary is necessarily brief, and for complete information reference is made to the full text.

Section 2, article (d), Proposal Forms has been rewritten in line with our present practice of registering proposal forms furnished to prospective bidders.

Section 2, article (k), Competency of Bidders has been rewritten in line with our present practice requiring prequalification before bidding on state highway work and requiring that proposals shall be accompanied by a statement setting forth a plan for prosecution of the work and a list of the machinery, plant, and other equipment available for use on the proposed work.

Section 3, article (f), Failure to Execute Contract has been revised to provide that the time allowed to execute the Contract and furnish the bonds start from the date the bidder receives notice that the contract has been awarded in lieu of the former provision starting with the date of award.

Section 5, a new article, lettered (j) has been added relative to plant and equipment, requiring that the contractor shall provide adequate and suitable equipment for the work and shall discontinue the use of unsuitable equipment and unsatisfactory plants.

Section 6, article (b), Source of Supply and Quality of Materials: A new paragraph has been added covering local materials when sources are designated in the special provisions. This is similar to the section relative to local materials, formerly included in the special provisions, and provides that when all of the acceptable material at designated sources has been exhausted, the State will reimburse the contractor for the cost of moving his plant to a new source of supply, and will make an adjustment for the difference in length of haul involved.

Section 6, article (d) Special Methods of Test: In the test for hardness and toughness of crushed rock and gravel a requirement has been inserted for loss in the Los Angeles Rattler after 100 revolutions as well as the loss after 500 revolutions.

Section 7, article (c) Patents has been rewritten to require that the contractor assume all costs arising from the use of patented materials, processes, etc.

Section 7, article (g) Preservation of Property: A new paragraph has been inserted, requiring that the contractor shall be liable for any damage by his employees or agents to duly authorized road signs located within the right of way.

The section on Clearing and Grubbing has been revised to permit stumps and large roots which are to be buried 3 feet or more under a fill to remain in place providing that such stumps are cut flush with the existing ground.

In the section on Earthwork the provision of article (e) that the State pay for grading construction roads has been eliminated, and the contractor is required to grade such construction roads as may be necessary at his own expense.

In that portion of the section on earthwork relating to excavation for structures a new paragraph has been added to article (p), Backfill, prohibiting the puddling of backfill in cases where the foundation material is such that it will soften when saturated, and in the case of high abutments or retaining walls where puddling might develop hydrostatic pressure behind the walls.

In the section on subgrade, the article covering subgrade for paving on existing rock or gravel surfacing has been omitted, also the article covering subgrade for second story concrete pavement has been omitted since the former specification will not apply with the newly adopted design using a cushion course for second story concrete.

The section on sand cushion has been entirely rewritten and entitled "Cushion Course." This section provides for the use of sand, gravel, or broken stone up to one inch in size, and calls for material with a cementing value of 50 pounds per square inch, or permits material with a low cementing value to be bound with heavy fuel oil.

In the section on Untreated Crushed Gravel or Stone Surfacing the cementing value has been increased from 80 pounds to 100 pounds. A new article (g) has been added to provide for stockpiling material for future maintenance at the rate of 100 tons per mile. Under the article "Measurement" provision is made that binder material actually entering into or becoming a part of the surfacing shall be included in the pay quantities.

In the section on Oil Treated Crushed Gravel or Stone Surfacing a paragraph has been included under article (d) stipulating that the amount of moisture in the aggregate at the time of mixing shall not exceed 3 per cent. Article (e), Placing, has been rewritten to require that material after spreading shall be bladed into windrows and respread to the required grade and cross-section, also, that should the mixture after spreading show the moisture content in excess of 3 per cent, the moisture content shall be reduced by reworking and allowing the material to dry before final spreading.

In the section on Crusher Run Base the grading requirements have been revised to specify a 20 per cent range for material passing and retained on a 3-mesh sieve, and to specify a limit for the quantity of 200-mesh material. Article (e), Rolling, has been rewritten to specify the number of rollers required in terms of amount of crusher run base laid per day. A new paragraph has been added to article (g),

Measurement, providing that the binder material actually entering into the work shall be included in the pay quantities, and the statement in article (c) that all binder material shall be furnished by and at the expense of the Contractor shall be eliminated.

In the section on Side Forms, article (b) relating to timber side forms has been rewritten to eliminate the use of white fir, and to specify Douglas fir, common, joist and plank grade. Also, side forms are required to be at least 4 inches deep except where placed on existing pavements. The supporting stakes are specified to be of adequate length to support the forms, but in no case less than 8 inches long. In article (c), the length of supporting stake for metal side forms is the same as specified for timber side forms. Article (e), Removing has been revised to provide that after completion of waterbound macadam or bituminous macadam surface timber side forms shall be removed. The former provision is retained that side forms shall be left in place on completion of asphalt concrete surface.

In the section on Waterbound Macadam Base, article (d), Rolling has been rewritten to specify the number of rollers required in terms of the quantity of macadam laid per day.

A new section has been added entitled "Bituminous Surface Treatment." This section will be No. 21, and sets forth the specifications for the so-called armor coat work.

In the section on Bituminous Macadam Surface a requirement has been inserted in article (b) for loss in the Los Angeles Rattler test after 100 revolutions. A new paragraph has also been added requiring that material shall be clean and free from dust and shall be washed if necessary to insure perfectly clean aggregate. Article (d), Rolling has been rewritten to specify the number of rollers required in terms of the quantity of macadam laid per day. Article (f), Placing has been expanded to require that distributors apply a uniform spread of oil, and specify methods to assure a uniform distribution of oil at the junction of two applications. Also, pneumatic tires are specified for oil distributors. In article (g), the amount of bituminous binder for the first application has been increased to include a range of from one-quarter to one gallon per square yard. This article has also been rewritten to require rolling before covering the first application of oil with key rock, and that the key rock be spread by means of a blade or drag. Before the second application of bituminous binder, areas containing excessively fine material are to be removed and replaced with clean key rock.

The five sections on asphalt concrete have been combined in one section to be No. 23 in the new edition. Some changes have been made in the gradings for the various mixtures specified, but otherwise these specifications remain essentially the same.

In the section on Portland Cement Concrete Pavement, article (d), the allowance for low subgrade has been changed to provide for paying for additional thickness of pavement at the contract price up to an increase of 3.16 inch over the authorized cross-section. In article (f), Placing, the requirement that the roadway opposite the side under construction shall be kept clear and open to public traffic has been omitted. Article (g), Superelevation has been omitted as superfluous. Article (h) will become (g), and requires that all longitudinal and transverse joints, both contact joints and weakened plane joints, be poured with asphalt by the Contractor. The article on expansion joints has been rewritten and elaborated upon as to the equipment required and method of placing expansion joints. A clause has been inserted in the article on tamping requiring a sufficient number of finishing machines to provide one machine for each

300 cubic yards of concrete laid in 10-foot widths per 8-hour day. The article on impervious membrane curing has been rewritten and expanded. In the article on Protecting Concrete Pavement, the size of specimens for flexure test has been decreased to 6 inches by 6 inches in section, also, the Contractor is required to furnish the labor to break the test specimens, while the state will furnish the moulds and testing machines.

The section on Second Story Concrete Pavement has been eliminated, as with the new design recently adopted, calling for a cushion course, there is essentially no difference between second story pavement and pavement laid on new subgrade.

The section on Steel Structures has been entirely rewritten and expanded.

In the section on Timber Structures a new article has been added requiring fire barrels and buckets be furnished and installed at the Contractor's expense.

In the section on Reinforcement a new article has been added, requiring that steel lists be submitted to the Engineer for approval. The article on placing permits the use of the wire of either 14 or 16 gauge. The minimum clear distance between parallel bars is specified as 2 inches, and the minimum embedment is specified as 1½ inches, except for stirrups, with the provision that the embedment shall be increased where concrete is exposed to the direct action of salt water.

A new Section 34 has been added, covering construction of arched masonry parapet.

The section on Corrugated Metal Pipe Culverts has been entirely rewritten, and includes the 5-clause specification adopted as standard by the American Association of State Highway Officials.

The section on Concrete Curbs and Gutters has been completely rewritten.

The section on Guard Rails permits timber posts to be either of redwood or cedar, and the length is reduced to 5 feet 4 inches so as to permit cutting 3 posts from a 16-foot stick. The requirement for notching timber posts to receive the rails has been eliminated.

The sections relating to paint and painting have been rewritten and consolidated into two sections. One section covers specifications for materials and paint formulae for various purposes, and the other section covers the application.

The section on Slope Paving provides a 4-inch mortar coat, where, due to steep slopes, the concrete is placed so dry that it will not flush under tamping.

A new section, to be No. 62, has been included on the design of steel highway bridges.

"Did you manage to give the cop the slip?"

"No, he gave me one."—*Erchange*.

The statistician who claims that the automobile industry has not yet reached the saturation point ought to ride in a rumble seat during a rain.—*Life*.

A colored man and his sweetheart, followed by three pickaninnies, applied to the clerk of a Southern court-house for a license to wed.

The clerk eyed the assemblage doubtfully.

"Whose children are these?" he asked.

"Dey our'n," was the ready response from the man.

The clerk was scandalized, being new at his post. "You ought to be ashamed of yourselves, waiting to get married till you have a family half grown—"

"Jedge, you'll have to excuse dat," interrupted the "bride," sweetly. "De roads out our way is so bad!"

Grade Crossing Warning

By JOSEPH G. HUNTER, Transportation Engineer,
California Railroad Commission.

THE recent accident on a grade crossing near Ceres in which four persons were instantly killed by a train striking an automobile, stresses the need of constant vigilance by all drivers of vehicles, especially those persons who are in the habit of passing over a familiar crossing frequently.

The driver of the vehicle that was struck by the train near Ceres was accustomed to pass over this crossing four times a day. He resided about two blocks from the crossing, and apparently was thoroughly familiar with the frequency of train operation over it.

The need of constant vigilance by the drivers of vehicles, and the danger of allowing familiarity with the crossing to dull one's sense of caution on approaching it, has also been strikingly emphasized recently by crossing fatalities involving members of the same family, and the same crossing, but in different accidents.

The fact that the grade crossing must continue as an unavoidable evil indefinitely is apparent from a study of the data on grade crossings in California. There are 14,638 grade crossings in the state, of which 12,311 are over main line tracks. It would cost upwards of \$1,000,000,000 to eliminate all of these potential hazards to traffic. To construct grade crossing separations on the major highway crossings alone, would cost approximately \$500,000,000. Of these crossings, more than 2600 are provided with some form of special protection, such as gates, human flagmen, police officers and automatic signals (wigwags).

The Railroad Commission, through its Transportation Division, is continually engaged in surveying the more hazardous crossings with the view to recommending the installation of additional crossing protection. Where the installation of wigwags or other warning devices is considered warranted, suggestion is made informally to the railroad companies that these signals be installed. If not agreed to voluntarily by the carriers, formal proceedings to compel their installation may be instituted. A considerable number of wigwag applications are now pending before the various carriers throughout the state, upon such recommendation.

It has cost the railroads more than \$3,000,000 to install the crossing warnings now in

MOVABLE MAIL BOX STAND IS DESIGNED



A movable mail box stand has been constructed by Superintendent Carl Nelson, and Foreman F. E. Smith of Merced, in District Six and is being used to replace the present stands in that vicinity.

The advantage of this type of stand is that it is easily removed from the shoulder to permit shoulder or road-side grading. The stand is of sufficient weight to stand in place and for removing is tipped and rolled on its base.

The material used in construction is salvaged or that which is of no further value for use for which it was originally intended.

The base consists of a Ford tire rim picked up along the road. A piece of old 2-inch water pipe is used for the riser, one end of which is punched with holes and wire strung through. This is set in the center of the rim and the space filled with concrete. The platform for the box is a piece of 6- by 6-inch guard rail post, the length of which is governed by the number of boxes it is to carry. For one or two boxes it is cut 18 inches long and a 6-inch bevel cut on each end. A hole is bored the size of the pipe and the block slipped on the box or boxes, being fastened either crosswise or lengthwise as the case may be. The stand is given a coat of white paint and presents a very neat appearance. Two accompanying pictures show single and double construction. The third shows their mobility.

(Continued on page 14.)

Beautification of Bay-
shore Highway



Courtesy Wins
Commendation



Sullivan Versed in
Desert Lore

Clippings, Letters and Comment



Dealing With State Highways

Code for Motorists is
Suggested



Act of Employee is
Appreciated



More Commendation
for Snow Removal

Beautification of Bayshore Highway.

The following letter has been received from Mrs. H. B. Sprague, chairman of the Civic Committee of the Burlingame Woman's Club of Burlingame:

120 Primrose Road, Burlingame,
February 17, 1930.

Mr. T. H. Dennis,
Sacramento.

Dear Mr. Dennis:

I want to thank you for sending to our club the two very splendid and interesting young engineers from your staff.

They gave us excellent talks on the work planned and doing on the Bayshore and their pleasant personalities impressed us most favorably.

We were delighted to be given the landscape plan for the boulevard and appreciate the favor immensely. I hope we can use the plan to good purpose in these meetings.

Very truly yours,

HANNAH C. SPRAGUE.

(Mrs. H. B.)

lined the fundamentals of landscape design as including unity, variety, character, propriety, and finish. He began at the San Mateo County line and gave a resume of the planting plan from there to Third avenue, San Mateo. The plan calls for a definite reason for each tree or shrub and it brings in the native trees and shrubs as much as feasible forming informal naturalistic groupings. Vistas will be created toward the bay and a windbreak planted in the windy sections with the idea in view of not cutting off the view of the hills. Something of the cost and maintenance of the work was outlined by the speaker with the entire cost estimated at \$26,109.

Courtesy Wins Letter of Commendation.

This letter comes from Ben Brown, Inland Division Plant Manager of the Pacific Telephone and Telegraph Company.

Sacramento, February 21, 1930.

Mr. R. B. Meek,
Director of Public Works,
State of California,
Sacramento, California.

Dear Mr. Meek:

I wish to express my appreciation of the help and cooperation given us by one of your highway foremen, Mr. E. M. Shelton at Mt. Shasta City on the afternoon of February 12, 1930.

Our truck driver and one man had a load of poles on a trailer and towed by an F. W. D. truck. The poles were being hauled from Dunsuir for delivery at Weed.

At Mt. Shasta City, in order to detach the load temporarily, the driver pulled off the pavement. Upon leaving the pavement two wheels of the truck dropped into the soft ground, burying themselves to the axle. After considerable effort on the part of our men, they were unable to move the truck. Mr. Shelton drove up and kindly offered the services of his tractor which was stored at Shasta City.

The offer was accepted and our truck was on its way within one-half hour.

This act is only one of many your employees have done during the reconstruction of our pole line in the Sacramento River Canyon and between Dunsuir and Yreka.

An act of this kind only proves to us that our efforts to create a cooperative spirit among our employees

Newspaper Article Tells of Plan.

This from the San Mateo *Times*:

That the general interest in the beautification of the Bayshore Highway is due in considerable extent to the work of the women's clubs and of their policy of encouraging tree planting was the point brought out yesterday when J. G. Standley, assistant maintenance engineer of the State Highway Commission, spoke before the Burlingame Women's clubs. The speaker outlined the general method of the Commission in granting permits to plant trees and taking care of them for one year before they revert to the care of the state. Recently the state employed a landscape engineer to coordinate the planting system.

Plans for beautifying the Bayshore Highway were outlined by H. Dana Bowers, State Arboriculturist. He believes that beautifying the highway should be dignified and well planned and increased from year to year, always bearing in mind that the trees form one of the community's greatest assets. Bowers out-

have borne fruit. For the continuance of this spirit, I am,

Yours truly,

BEN BROWN,
Division Plant Manager.

* * * * *

Sullivan Versed In Desert Lore.

The San Bernardino *Telegram* publishes the following article:

E. Q. Sullivan, district engineer of the California Highway Commission, who has made an exhaustive study of the desert, claims that markings indicate that once upon a time, a series of immense lakes flooded the entire desert district.

"Outlines of the beach lines of these lakes may be seen easily in the district near Yuma. There was, at one time, a series of lakes between Victorville and Baker. Scientists who have made investigations of these conditions claim that they are preglacial lakes," Mr. Sullivan stated.

"The largest lake, according to the shore outline, extended from Yermo to Baker, a point 30 miles east of Yermo, and 150 miles from San Bernardino. The State Highway crosses this shore line near Baker."

Mr. Sullivan has photographs of carving and writings found on rocks and in caves in the eastern part of San Bernardino County. There are three types of carving found, two of which, no doubt, were made by Indians.

The third is of a deeper nature and indicates long existence. This third type also appears to be of a more intellectual nature, scientists claim.

* * * * *

Code For Motorists Is Suggested.

The following editorial appeared in the *Stockton Record*:

California's Highway Patrol, provided by the Young administration to protect motorists and reduce traffic deaths, has been provided snappy uniforms and spick and span white motorcycles and automobiles. Bert B. Meek, Director of Public Works, has also given the highway patrolmen a code of ethics. The ideal traffic officer must live up to the following formula, according to Meek:

He must be patient, even where impatience would seemingly be justified.

He must be courteous, even to those who may not be courteous to him.

He must be kindly without sacrifice of firmness.

He must be both a teacher and an officer, his attitude instructive toward those who desire to be instructed.

His control must be courteous but immediate and certain toward those who refuse instruction.

The Meek rules put a heavy tax on the frailties of human nature. To be patient where the circumstances do not justify it and to be courteous when others are "nasty" calls for an officer little short of a combined diplomat and a saint. To keep him in such a frame of mind, the motorist must meet him half way. The car operator will have to have a little code of his own based on the safety campaign instructions of the past few weeks. It might read as follows:

The motorist must observe boulevard stops and not try to slide through.

He must not attempt to pass a standing street car except at a safety zone and then at a speed not over

ten miles an hour. He must slow down in passing schoolhouses.

He must not attempt to pass other cars on a curve.

In case of doubt at a street intersection, he had better yield the right of way, lose a couple of seconds and escape trouble.

If an officer corrects him, he must take the instruction in the spirit that it is given and not try to show himself a "chesty" American citizen.

* * * * *

Employee Wins Commendation.

The following letter of commendation comes from the California State Automobile Association:

Mr. T. H. Dennis, Maintenance Engineer,
State of California Highway Commission,
Sacramento, California.

Dear Mr. Dennis:

During the month of December, one of our highway foremen by the name of Jack Haney apprehended and reported a man by the name of Virgil Brown, who destroyed at least two of our standard reflector signals and the consequence was that said Virgil Brown was fined \$50, in addition to being compelled to pay for the two reflector signals he admitted having destroyed. He was also given a 90-day jail sentence, which was suspended.

I have discussed this matter with our General Manager and several of our directors, who wish me to express to you their appreciation of this splendid service. It is really too bad that those destroying so many of our signs apparently do it in such a way that they are not apprehended. Although we are paying Mr. Haney our usual reward, I am sure that he did not consider this phase when he was attempting to defend our highway signals.

I thought you would be interested in knowing of this case.

Yours very truly,

J. W. JOHNSON,
Chief Engineer.

* * * * *

More Commendations For Snow Removal.

Below is the text of a letter received by District Engineer Comly, from the Intermountain Sportsmen's Association at Burney.

Burney Branch of the
INTERMOUNTAIN SPORTSMEN'S
ASSOCIATION

Burney, California,
February 15, 1930.

Mr. H. S. Comly,
c/o California State Highway Commission,
Redding, California.

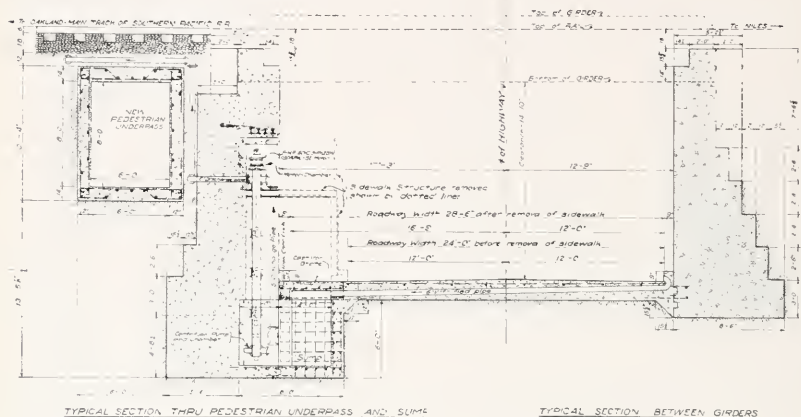
Dear Sir:

At a meeting of our association on February 14, a resolution was made that we express our appreciation for the good work done by the maintenance men of your district, and the Highway Commission, in keeping the roads open during the recent snow storms.

Sincerely,

(Signed) D. M. DESMOND, Secretary.

Rebuilding An Underpass Under Traffic



A unique improvement was obtained at the undergrade structure of the Southern Pacific Railroad in Niles. For some time past this structure has served traffic, the roadway width being but 24 feet. In view of the reconstruction work in which we are providing a 30-foot width of pavement on high standards, permitting of the highest speed permissible, has brought about an acute situation in which fast moving traffic, moving toward the underpass in three-way lanes, could not negotiate the underpass; therefore, the department deemed it advisable to remove the 5-foot sidewalk area in order to take advantage of the additional area which allows the roadway width to be increased from 24 feet to 28 feet 6 inches, without disturbing the abutments supporting the Southern Pacific overhead girder.

Pedestrian traffic is being taken care of through the construction of an 8-foot by 6-foot pedestrian underpass installed under the railroad tracks immediately behind the massive concrete abutment and within the highway right of way. The material benefit derived from this reconstructed underpass is of inestimable value, yet the approximate cost of the alteration was only \$8,500. While the full width of 28½ feet is not sufficient to provide ample room for three-way traffic, yet it is wide enough to avert serious accidents which may have occurred in a structure of narrower width. All traffic on this important highway is being carried along the work without any detours, although there is a highly adequate one available for through traffic. The work is attracting widespread attention.

GRADE CROSSING WARNING

(Continued from page 11.)

operation, while the yearly maintenance cost of this equipment is \$1,000,000.

In regard to the responsibility of drivers of vehicles in grade crossing accidents, attention is called to the fact that both the California and the United States Supreme Courts have held in opinions that it is the duty of the driver of vehicles on the highway to make

sure that no train is approaching before crossing over railroad tracks. If necessary, the court held, the driver of the vehicle on the highway should get out and look up and down the track to assure himself that the way is clear for safe passage.

It should be remembered also that the California Motor Vehicle Act prohibits drivers of vehicles from attempting to drive over a grade crossing when the warning signals are in motion.

Progress Made in
Water Resources
Investigation

Irrigation District
Matters

Review of February Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Federal Power
License Fees

Dam Inspections

Reclamation and
Flood Control

SAN JOAQUIN VALLEY WATER INVESTIGATION

Surveys for the location of main supply canals have been continued throughout the month. The survey of the canal from the Kings River to Kern County (130 miles) has been completed. Mapping of this line is about 50 per cent completed.

A topographic survey at the mouth of the Kern River Canal has been initiated. It is planned to locate a canal at the mouth of Kern Canyon so as to serve agricultural areas now without a water supply south and east of Bakersfield with Kern River water. An exchange would be made with Kings River water at the crossing of the Kern River supplied through the Kings River-Kern County Canal.

A reconnaissance has been made of the possibility of diverting water from San Joaquin River at Temperance Flat Reservoir into the Kings River at elevation 445, the present intake elevation of Kings River-Kern County Canal location. If this is practical it would eliminate an exchange of water at Kings River; San Joaquin water being delivered directly to the areas of deficiency in Tulare and other counties. Only extended and exhaustive studies can determine the efficiency of this method compared with the plan which would effect an exchange at the Kings River.

A transverse and cross section survey has been made of Snodgrass Slough, which has been completed, and surveys are now being extended down the South Fork of the Mokelumne River. The purpose of this survey is to collect and compile data so as to permit an estimate to be made of the cost and feasibility of transporting water across the delta from the Sacramento to the San Joaquin River, placing it in a more advantageous position for pumping up the San Joaquin River.

A paper location has been made of a purely gravity canal from the American River to Kern County. Cost estimates are only partially complete. No field surveys are contemplated in connection with this location; however, the terrain will be examined in the field for guidance in the preparation of cost estimates for this line.

LAND CLASSIFICATION AND CROP SURVEY

Land classification has been completed for the entire valley and results have been mapped and were submitted to the San Joaquin Valley Water Committee on February 14th for review.

Field work has been completed for the crop survey for the entire valley and the data are now being compiled in the office.

GROUND WATER INVESTIGATION AND WELL RECORDS

The collection of all data on wells in the San Joaquin Valley has been completed, including the

season of 1929. Mapping and analyses of these data are going forward in the office with a view of determining the consumptive use of water in the San Joaquin Valley. It is also planned to prepare maps delineating the depth to ground water and the ground water elevations for the year 1929.

WATER SUPPLY AND YIELD STUDIES

Reservoir studies for the maximum possible yield for irrigation purposes have been completed for the Kern, Tule, Kaweah and Kings rivers. Those for the San Joaquin River are also nearing completion.

ENGINEERING ADVISORY COMMITTEE

A meeting of the Engineering Advisory Committee was held in Sacramento on January 31, 1930. All members were present except Mr. Herrmann. Water supply estimates were reviewed and a program of ground water investigation was approved. Unit prices to be used in the preparation and cost of physical works were discussed and those pertaining to the main supply canals were adopted.

SACRAMENTO VALLEY INVESTIGATION

Estimates of the monthly run-off, after deducting ultimate upstream diversions, are being made on the five main stream systems of the valley for the 40-year period 1889 to 1929. Estimates of the full natural flow of all the streams tributary to the Sacramento Valley for the same 40-year period have been completed and submitted to the Engineering Advisory Committee for review.

RESERVOIR SITES

Data have been gathered and a field inspection made on all possible foothill reservoir sites on all the minor as well as the major streams entering the Sacramento Valley. These data are now being compiled in the office with a view of making surveys, if necessary, and estimates on the more feasible ones.

LAND CLASSIFICATION AND CROP SURVEY

Classification of lands in Sacramento Valley has been completed on about 5,000,000 acres and a crop survey on about 4,000,000 acres. The areas of lands and crops are being tabulated by counties, irrigation districts, reclamation districts, water districts and companies. A map showing the land classification of the valley floor is completed and will be extended to also include the foothill areas. A map showing the general location of crops is also being prepared.

WATER REQUIREMENTS OF IRRIGABLE LANDS

Additional data have been gathered on the present use of water for different crops and a preliminary

office report on this subject has been prepared. Data are being gathered on the locations and extent of riparian lands along the Sacramento River.

ENGINEERING ADVISORY COMMITTEE

The Engineering Advisory Committee on Sacramento Valley investigations has been appointed and held one meeting in San Francisco on February 5, 1930. The members of the committee are: J. D. Galloway, F. C. Herrmann, Walter L. Huber, J. B. Lippincott and Fred H. Tibbets. A program outlining the investigation was presented to the committee for their review and comment. Matters concerning water supply, land classification and location of reservoirs were discussed.

SALINITY INVESTIGATION

The work on salinity investigations during the past month has been chiefly confined to office studies and investigations. An intensive study is being made of the vast amount of data taken during the past season to determine the relation between stream flow and salinity and the variation of salinity with tidal action. The basic data have been compiled, including stream flow, salinity and tidal data, and intensive work is now under way on the analytical studies of these data.

Field work during the past month has included the maintenance of 26 regular salinity observation stations and 8 drainage salinity stations and the operation and maintenance of automatic tide gages. Four additional automatic tide gages were installed early in the month, including three in South San Francisco Bay at Hunters Point, San Mateo Bridge and Dumbarton Bridge, and one at Point Richmond.

SALT WATER BARRIER INVESTIGATION

During the past month negotiations were continued with the U. S. Army Engineers on a program of cooperative work covering certain phases of the salt water barrier investigation. These negotiations have culminated in an agreement by the U. S. Army Engineers to undertake the following studies as outlined in the December progress report:

Relation of the Barrier to Navigation.

Relation of Barrier to Tidal Action.

Relation of Barrier to Movement of Silt and Water Borne Debris.

General Review of the Design and Construction of the Barrier with Particular Regard to the Minimum Requirements of Lockage and Flood Gate Features.

This work will be conducted by the First District Army Engineers in San Francisco. It is expected that the Second District Army Engineers at Sacramento will undertake studies on the relation of the barrier to the Sacramento and San Joaquin River Flood Control Project.

On February 1st the initial conference of the Consulting Committee appointed for the salt water barrier investigation was held in San Francisco. The members of the Consulting Committee present were: Charles D. Marx, Charles T. Leeds, A. Kempkey, Thomas H. Means and George A. Elliott.

The program as outlined for the investigation and the detailed questionnaires prepared for obtaining data were reviewed by the committee and recommendations made as to changes or additions.

Questionnaires covering the industrial, reclamation and agricultural industries are now being finally

revised, and it is expected that work will be started in the near future on an intensive survey of the industries and the reclamation and irrigation developments.

The Fish and Game Commission has started cooperative studies on the fishing industry and its relation to the proposed barrier.

SOUTHERN CALIFORNIA INVESTIGATIONS

On all investigations in the west coastal plain and in southern California work has continued during the month in a routine manner. Surveys for installation of diversion works and spreading works in the Santa Ana Canyon have been completed in the field.

PIT RIVER INVESTIGATIONS

Investigation work on the Pit River has continued throughout the month and progress report for the year 1928-1929 on the Pit River investigation is practically complete.

GENERAL

The investigations being conducted in the Napa Valley, Napa County, Ventura County and Santa Clara County comprising a study of the water resources of these areas have been actively carried on during the present month under the plans and procedure outlined in our Progress Report No. 22 dated January 23, 1930.

IRRIGATION DISTRICTS

During the month visits of inspection were made to the Bard Irrigation District in Imperial County, the Vista Irrigation District in San Diego County, the Oroville-Wyandotte and Table Mountain Irrigation districts in Butte County, the Cordua Irrigation District in Yuba County and the Glenn-Colusa Irrigation District in Glenn County.

The sufficiency of the petitions for the formation of the proposed Rio Seco Irrigation District comprising 8000 acres and the proposed Richvale Irrigation District comprising 19,000 acres in Butte County, were acted upon favorably by the Board of Supervisors of Butte County, and reports of sufficiency filed with the State Engineer. An investigation of the proposed Rio Seco Irrigation District has been made by this office and a report on the district is now in course of preparation.

Conferences have been held with proponents of the proposed Dixon Irrigation District comprising 5000 acres, situated in Solano County, and with officials of the Clear Lake Water Company, from which the district proposes to purchase water.

The State Engineer, on the 19th of February, attended a meeting at Yuba City and explained the procedure necessary for the organization of an irrigation district under the California Irrigation District Act, to landowners of the "Peach Bowl" area in Sutter County. This is a highly developed area which has been dependent upon ground water for its irrigation and, because of the inadequacy of this supply, the

organization of an irrigation district is contemplated for the purpose of securing an outside water supply.

Conferences have been held with officials of the West Stanislaus Irrigation District in Stanislaus County, and the Oroville-Wyandotte Irrigation District in Butte County, for the purpose of discussing proposed construction plans and developments contemplated by these districts.

Questionnaires have been mailed to all irrigation districts in the state requesting information regarding their principal activities in 1929 for the purpose of keeping up to date the statistical data presented in Bulletin No. 21 of this division.

The State Engineer held a hearing at Hanford on February 4 on a petition for the exclusion of certain lands from the Tulare Lake Basin Water Storage District located in Kings County.

CALIFORNIA BOND CERTIFICATION COMMISSION

The California Bond Certification Commission approved the sale of \$108,000 par value of bonds of the second division of the second issue of bonds of the Nevada Irrigation District for construction work necessary in the development of the project.

FEDERAL POWER COMMISSION LICENSE FEE MATTERS

Some eighteen months ago the State Engineer called into question the allocation which was being made of Federal Power Commission license fees. It appeared that the individual states were not receiving the full allocation to which they were entitled out of fees collected annually from licensees of the Federal Power Commission. The matter was first taken up with the local office of the Federal Power Commission and later with the Washington office. The subject was brought up for discussion at the first annual conference of Western State Engineers held at Salt Lake City in October, 1928, and again at the second annual conference held at Reno in December, 1929, thereby enlisting the support of that organization. On February 3, 1930, the Comptroller General of the United States upheld the original contention of this office. This will make available to the several states, and particularly to California, an increased allocation by the federal government out of license fees collected annually from licensees of the Federal Power Commission. If the interpretation is made retroactive some \$81,000 in back fees will become payable to California. The present annual payments will be increased from some \$6,700 to more than \$25,000, and the payments due when the hydro-electric possibilities of California are fully developed will be increased several hundred thousand dollars per year, according to present estimates. This money goes into the General Fund of the State of California.

In addition to this phase of the matter it was discovered during the course of the study upon the subject that the allocation payable to the Reclamation Fund of the United States was also short. This allocation amounts to 33 1/3 per cent more than the allocation to all of the states combined. The allocation for the fiscal year ending June 30, 1929, is increased from \$17,176.49 to approximately \$45,000.

DAMS

Applications received for approval of dams built prior to August 14, 1929: 172 applications were received for existing dams making a total of 500.

As noted in last month's report, owners are still slow in filing applications for their dams. February 14th was the limiting date set by law for filing and this office is now preparing to notify the delinquent owners that they have not filed in accordance with the law. If they still do not file within thirty days from receipt of this notice they are guilty of a misdemeanor under the provisions of Section 17, Chapter 706. There are still about 260 dams for which applications have not been filed.

Application for construction has been received as follows:

Dam	County	Owner	Estimated cost
Rock Creek	El Dorado	Arthur E. Risor	\$2,000

Applications for repairs or alterations have been received as follows:

Dam	County	Owner
Burbank No. 4	Los Angeles	City of Burbank
Dennison	Ventura	Dennison Ranch Company
Behedere	Marin	Marin Municipal Utility District

Plans approved for construction or enlargement:

Dam	County	Owner	Estimated cost
Pickering Pond*	Modoc	Pickering Lumber Co.	\$22,194.29
Ridgewood*	Mendocino	Chas. S. Howard Co.	9,631.00
Crouch*	San Diego	Chas. S. Crouch	25,188.25
Merced Falls*	Merced	San Joaquin Light & Power Co.	50,000.00
Burbank No. 5*	Los Angeles	City of Burbank	34,750.00
Everly*	Modoc	Irving C. Everly	1,500.00
Sunset Canyon*	Los Angeles	L. A. County Flood Control District	22,660.00
Moccasin Creek*	Tuolumne	City of San Francisco	600,000.00
Silver Lake**	Amador	Pac. Gas & Elec. Co.	16,000.00

*Construction

**Enlargement.

Plans approved for repairs or alterations:

Dam	County	Owner
Concow	Butte	Thermalito and Table Mountain Irrigation Districts
Spooner	Lassen	J. J. Fleming & Co.
Yorba	Orange	Anaheim Union Water Co.

Inspection of dams under construction, enlargement or repair:

Sixteen dams are under construction, enlargement or repair in the state at present, as follows:

Dam	County
613 Bear Gulch***	San Mateo
12 Calaveras*	Calaveras
6-4 Chatsworth***	Los Angeles
47 Concow***	Butte
5-2 Glendale*	Los Angeles
32-6 Hansen*	Los Angeles
31-2 Juncal*	Santa Barbara
6-15 Lower San Fernando**	Los Angeles
97-73 Lyons*	Tuolumne
841-2 Mary Joe*	San Diego
95-10 Merced Falls**	Merced
97-66 Salt Springs*	Calaveras
104-18 Shaver Lake***	Fresno
778 Wrigley*	Los Angeles
791 Yorba***	Yuba

*Construction

**Enlargement.

***Repairs.

Inspections on Various Existing Dams are now being made with a view to their early approval. With this in mind, three new inspectors have been employed, bringing the total of field men to seven, each covering an allotted territory.

Rainfall and Run-off Studies. Steps are being taken to make a study of rainfall intensities over limited areas together with the corresponding run-off. This will help determine the required spillway capacity of dams to carry peak flows. Areas are being selected in different parts of the state which are typical of the various conditions existing. Automatic recording rain and stream gages will be established in these areas for the purpose of obtaining the run-off of maximum rainfall during short periods. These studies are being conducted for this office by the Water Resources Investigation staff.

FLOOD CONTROL AND RECLAMATION

During the period from January 16 to February 15, inclusive, an average of 130 employees have been engaged upon this work, exclusive of contractor's employees.

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Project maintenance work on the Sutter By-pass system has been mostly routine, including operation of the drainage pumps for short periods. There have been no heavy storms nor high water.

Several small jobs of protective work have been carried out in the Tisdale By-pass and on the upper Sutter By-pass. These consist of brush and tree mats secured with screw anchors. Some replanting of the willow protection along the east levee has been accomplished. A thorough check has indicated that only 5 per cent of the total willow planting must be replaced. The balance of the trees show fairly vigorous life, but at least along 50 per cent of the length of the planting the growth progress is disappointing.

Some work has been done in leveling and improving the appearance of the grounds around pumping plants No. 1 and No. 2.

The dragline excavator operated by the Dutton Dredge Company has been engaged during the entire month in cleaning out the Wadsworth Canal and the East Intercepting Canal. Upon completion of this work, it will reconstruct one-half mile of the West Intercepting Canal and then proceed with cleaning of the ditches in the pumping plant No. 3 system. This machine is operating very satisfactorily.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

Most of the small jobs of bank protection work under way have been completed and have been previously reported as under way.

Seven tree retards in the Feather River at Nicolaus included in the contract with the Pacific Coast Construction Company have been completed, and by arrangement with Sutter County an additional three retards will be constructed at once. On the Sacramento River near Knights Landing in Reclamation District No. 730 the Pacific Coast Construction Company has completed three retards out of the eight covered by contract, and rapid progress is being made on the completion of the others.

The work of constructing the barrier across Hefner Slough, at Robinson Bend on the Feather River has

been completed. A number of snags were removed from the channel of the river opposite this work and some clearing of willows on bars has been done. Also the old channel across the bar has been cleared out. All of this work has been done with the attempt to rectify the flow of the current along this bend.

Under contract, Leonard T. Isham of Rio Vista is constructing a bulkhead of redwood timber 850 feet long in the Sacramento River one mile below Isleton.

Tentative arrangements have been made for construction of two retards on the right bank of the Sacramento River about three miles below Princeton, in cooperation with Reclamation District No. 2047. The estimated cost of this work is \$6,000.

SACRAMENTO FLOOD CONTROL PROJECT

An average of 81 men have been employed on clearing in the Sutter and Butte Slough By-passes during the past month. The camps in the lower Sutter By-pass were discontinued. All of the work now under way is being carried on in the upper Sutter By-pass and Butte Slough By-pass with the exception of that being done by A. Mitchell, who has a contract to clear an acreage in the lower Sutter By-pass. Fifty-seven thousand dollars has been spent in by-pass clearing since October 1, 1929.

A large part of the work of clearing in the last two months has been with crews employed directly by this division and under adverse conditions at times on account of the weather. However, the work has been carried on almost continuously because it furnished work for many of the local residents in Sutter County who were very much in need of it.

Five contracts are under way for clearing timber in the Feather River overflow channel above Marysville, and this work is approximately 60 per cent complete.

Reports have been prepared on several applications for the Reclamation Board and a number of orders respecting applications have been written. Some work has been done in connection with securing rights of way for various levee construction projects under way in charge of the California Debris Commission, which are paid for in part by state funds. This includes incidental construction in connection with the West Intercepting Canal rights of way.

RUSSIAN RIVER JETTY

No work is now under way except the placing of quarry rock along the jetty. This is being continued with a crew of seven men, which is sufficient to operate the shovel at the quarry and the delivery of the rock by the industrial railway.

It is expected that the continuation of the jetty out into the sea for a distance of 300 feet will be commenced about April 1, and arrangements are being made to place the necessary materials on the ground.

FLOOD MEASUREMENTS AND GAGES

Some clearing of brush has been done at several of the water metering stations, and during the period all of the automatic water stage recorder stations have been supervised and kept in operation.

A new automatic water stage recording station has been installed in the Yolo By-pass at Lisbon. This is a standard U. S. G. S. (McGlashan station), consisting of a well and recorder house of 36-inch diameter corrugated pipe. A Stevens Type "A" recorder is installed.

Staff gages have been installed on the Cosumnes River at the state highway, at each of the openings in the new highway embankment. During the period stream flow measurements have been made at the following stations: Bear River at Wheatland; Sacramento River at I street bridge.

Policy Relative To Brake Testing Is Announced

The following statement relative to brake-testing stations has been issued by Eugene W. Biscailuz, superintendent of the California Highway Patrol:

It has come to our attention that a misunderstanding has occurred regarding the authorization of brake-testing stations in the State of California.

Misleading statements have been given a certain amount of publicity which we deem it only fair to correct. Section 111½ of the California Vehicle Act, 1929, provides as follows:

(a) The chief of the division of motor vehicles is authorized to designate, furnish instructions to, and to supervise official stations for adjusting headlamps, and auxiliary driving lamps to conform with the provisions of this act.

(b) The chief of the division of motor vehicles is authorized to designate, furnish instructions to, and to supervise official stations for adjusting brakes to conform with the provisions of this act.

(c) The establishment of official headlight adjusting stations or brake-testing stations shall mean the designation of any place which shall comply with the requirements of a test station as determined by the chief of the division of motor vehicles. When headlamps or auxiliary driving lamps have been adjusted or brakes tested in conformity with the instructions issued by the chief of the division of motor vehicles, a certificate of adjustment shall be issued to the owner or operator of the motor vehicle, on a form prescribed by the chief of the division, and showing date of issue, registration number of the motor vehicle, owner's name, make of vehicle, and official designation of the adjusting station.

(d) If the chief of the division of motor vehicles finds that the business of any official adjusting or testing station is being poorly or badly conducted, he may revoke the designation of such station.

Shortly after February 1st, inspectors of the California Highway Patrol began inspections of all stations which had made applications for designations as official brake-testing stations.

The Division of Motor Vehicles is not recommending, suggesting or prohibiting any type of brake adjusting or testing machine or equipment in the official stations.

In appointing official brake-testing stations, the Division will consider the reputation of the applicant as a business house, the ability of the men employed to do the adjusting, the location of the garage, shop or service station, the demand for official stations in that community and other qualifications, rather than the fact that a station has or has not a particular type of brake-testing machine.

In other words, the use of any brake-testing device alone, is no guaranty that such station will be designated as an official station as many other factors will be considered, nor will there be any exclusive territory given to any particular station in any locality. Every effort will be made to designate stations that have a reputation for fairness, honesty and efficiency, and to refuse stations to those who do not have a clear record.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

Inspector J. J. Borree returned from an eastern trip taken in the interest of highway patrol schools. His reports submitted are very interesting, and no doubt will prove of great benefit to us in conducting the activities of the California Highway Patrol. During Mr. Borree's trip he studied the various methods of registration in other states, and feels that we in California have as complete a system as any he saw.

While in Pennsylvania, New York and Massachusetts, Mr. Borree visited many patrol stations and made contact with a large number of the patrolmen through the courtesy of the highway patrol superintendents.

In New York and Massachusetts the highways are patrolled by state police who have police duties as well as safeguarding the highways. This dual responsibility is not working to the entire satisfaction of these states. While police matters are properly taken care of the patrolling of highways is not cared for in a consistent and efficient manner.

A similar situation existed in Pennsylvania, but in order to secure efficiency two distinctive enforcement agencies were formed, placing all police work on the Pennsylvania State Police and highway patrolling on the Pennsylvania Highway Patrol.

CHAUFFEURS' LICENSES

Despite the fact that the new motor vehicle act, automatically relieved a large number of persons in California from paying chauffeurs' license fees, a sharp increase in the number of chauffeurs for 1929 is reported.

Records for the year show a total of 146,732 registered as chauffeurs, a gain of 9734. The fee up to the time the new law became effective August 14th was \$2. The new law reduced the fee to \$1 a year and redefined the term chauffeur as being any "person who drives a motor vehicle for another on the public highways and receives compensation therefor."

This automatically took thousands of persons out of the classification of chauffeurs, relieving them of payment of the fee.

In its announcement the division called attention to the fact that all chauffeurs' licenses issued any time during 1929 expired on December 31st and that renewal of such licenses is required.

The chauffeur's last year's card must accompany his fee of \$1 and application. If he has lost his last year's card he must apply for a duplicate.

Under the California law, applicants must be over 18, in good physical condition and must submit to a special test if the application is an original one. A chauffeur's license is not required to operate implements of husbandry such as farm machinery, tractors, etc., over the highways temporarily.

It is unlawful to employ any person to act as chauffeur unless he has been licensed.

"Bill Jones was a good sport, and lucky, too. He might have been rich if he'd chosen some other form of gambling."

"What was his favorite sport?"

"Beating the fast express to the grade crossing. And he won nineteen times straight before the locomotive tied him."

Highway Awards Made in February

IMPROVEMENTS MADE POSSIBLE BY CONTRACTS

Alternate to the Ridge Route

Of widespread interest to the state as a whole was the awarding of a contract for construction on the first unit of the "Alternate to the Ridge Route" from Castaic School to Canton Creek, in Los Angeles County, distance of 7.1 miles to be graded 38 feet wide. This award was made to H. E. Doering & Van der Hellen & Pierson of Berkeley for a contract price of \$537,629.50. This newly adopted route will eliminate the long and tortuous adverse grades of the Old Ridge Route, on the road between southern California and the two great valleys of the central and northern portions of the state. It follows the canyon to the west of the present road, connecting with it at Tejon Pass. The new route is to be in keeping with the modern standards of alignment and gradient and will greatly facilitate traffic over this heavily traveled highway.

Mojave-Owens Valley Route

The last remaining unimproved section of the road between Mojave and the Owens Valley will be brought up to a high standard of grade and alignment through the award of a contract for grading and surfacing with oil-treated crushed gravel 15 miles in Kern County between Cinco and 7 miles north of Ricardo. This contract was awarded to George Herz & Company of San Bernardino for a contract price of \$242,768.80. The roadbed is to be graded 36 feet wide and surfacing to be 20 feet consisting of crusher run base on oil-treated crushed gravel. Traffic will be afforded some 200 miles of improved highway through Kern and Inyo counties to the recreational areas of Sierra Nevada, with the hazards of desert travel minimized and distance and time materially decreased. The present improvement runs through weird and scenic Red Rock Canyon which is a favorite winter recreation spot for many people from southern California cities. Much attention has been given to the desert drainage problems on this new project and the use of dikes and dykes will protect the road from damage by cloudbursts.

Pacific Highway

A reinforced concrete bridge located 5.5 miles north of Yreka on the Pacific Highway in Siskiyou County will be erected by Jacobs & Pattiani of Oakland, who were awarded the contract for \$71,548. This bridge will consist of one 200-foot open spandrel arch span and three 40-foot girder approach spans, with a clear roadway width of 24 feet. This project is a unit of the realignment and reconstruction of the portion of the Pacific Highway from Yreka to the Klamath River. This structure spans a deep gulch, obviating the use of an extremely heavy fill at this point.

Angels Camp-Markleeville Route

Beerman & White of Stockton were awarded a contract for \$67,965 to produce and stockpile screenings for bituminous surface treatment and surface with untreated crushed gravel or stone 15.5 miles between Murphy's and the Big Trees. This project was constructed by the Bureau of Public Roads, and is a portion of the mountain road from Angel's Camp to

Markleeville. When completed the public will be afforded a safe and smooth road to the popular resorts of this district for both summer and winter sports.

COMPLETION OF CONTRACTS

Redwood Highway

A contract in Del Norte County for placing perforated metal pipe underdrains between Elk Valley and 1½ miles south of Smith River, for about 1½ miles, at an approximate cost of \$16,700 has been satisfactorily completed and accepted. Smith Brothers of Eureka were the contractors.

Pacific Highway

Contract for constructing a graded roadbed and placing a Portland cement concrete pavement between Shasta River and Gazelle in Siskiyou County, for a distance of 7.7 miles, at an approximate cost of \$324,500, has been satisfactorily completed and accepted. T. M. Morgan Paving Company of Los Angeles were the contractors.

Another contract on the Pacific Highway for constructing a Portland cement concrete pavement at Mullen Crossing, between Woodland and the Davis Wye, Yolo County, distance of but 0.2 of a mile, approximate cost \$6,500, has also been accepted. C. W. Wood of Stockton was the contractor.

Victory Highway

C. H. Gildersleeve of Felton was the contractor who recently completed a contract for constructing a bridge across Coon Creek near Ewing in Placer County, at an approximate cost of \$9,280.

Tahoe-Ukiah Route

Contract for constructing a graded roadbed and placing an untreated crushed stone surfacing between Lucerne and Clear Lake Oaks, distance of 10.6 miles, at an approximate cost of \$299,300, has been satisfactorily completed and accepted. Von der Hellen, Pierson & Logan of Medford, Oregon, were the contractors.

Stockton-Santa Cruz Route

In San Joaquin County a contract for constructing a graded roadbed and placing a Portland cement concrete pavement between Santa and the San Joaquin River bridge, distance of about 3.1 miles, at an approximate cost of \$148,500, has been satisfactorily completed and accepted. C. W. Wood of Stockton was the contractor.

Another contract in the same county for constructing two bridges near French Camp at an approximate cost of \$23,600, has been satisfactorily completed and accepted. M. B. McGowan of San Francisco was the contractor.

Valley Route

Griffith-Hunter, Inc., of Sacramento were contractors who recently completed the construction of

bridges across the Cosumnes River and overflow channels near McConnell's Station, on the Sacramento-Stockton portion of the Valley Route, at an approximate cost of \$130,200, which has been satisfactorily accepted.

In Los Angeles County on this same route a contract for constructing a graded roadbed from Tunnel Station to Santa Clara River, for a distance of 8.6 miles, at an approximate cost of \$439,100, has been satisfactorily completed and accepted. R. G. Le Tourneau and O. A. Lindberg of Stockton were the contractors.

Coast Route

A contract for constructing an overhead crossing and grading and surfacing the approaches with bituminous macadam near Sargent, in Santa Clara County, at an approximate cost of \$85,600, has been satisfactorily completed and accepted. Barrett & Hilp of San Francisco were the contractors.

In Ventura County on this same route, a contract for constructing a graded roadbed and placing asphalt concrete pavement between Conejo Creek and Camarillo, for a distance of 2.3 miles, at an approximate cost of \$39,800, has been satisfactorily accepted. Griffith Company of Los Angeles was the contractor.

In Orange County on the above route, a contract for cleaning and painting the Santa Ana River bridge, approximate cost of \$2,467, has been satisfactorily completed and accepted. The Los Angeles Sand Blasting Company of Los Angeles was the contractor.

Mojave-Barstow Route

The Allied Contractors, Inc., of Omaha, were contractors who recently completed construction of graded roadbed and oil-treated crushed stone surfacing between 4 miles west of Hector and 8 miles west of Argos, 14 miles in San Bernardino County and at an approximate cost of \$191,300.

Mojave-Owens Valley Route

A contract for constructing a graded roadbed and placing oil-treated crushed gravel or stone surfacing between 7 miles north of Ricardo and Freeman, in Kern County, for a distance of 10.2 miles, at an approximate cost of \$105,400, has been satisfactorily completed and accepted. G. W. Ellis of Glendale was the contractor.

San Bernardino-Nevada State Line Near Jean

Gist & Bell of Alameda recently completed a contract for constructing a graded roadbed between Alray and Summit, San Bernardino County, for a distance of 3.8 miles, at an approximate cost of \$135,200.

Clermont-Riverside Lateral

Contract for constructing bridges across San Antonio Creek and Collins Dip in San Bernardino County, at an approximate cost of \$35,900, has been satisfactorily completed and accepted. W. J. Nethery & Son of Riverside were the contractors.

ALBERTA'S gravel road mileage will mount to about 1000 miles at the end of the year if last year's program is continued at the same rate.

DETROIT—Completion of the mile and a quarter vehicular tunnel to Windsor will be celebrated this fall. The great tube will cost about \$25,000,000.

CHICAGO—The new plan for the Austin-Kinzie superhighway leading into the city from the west side will allow for a traffic of 80,000 vehicles daily.

Traffic Views of Public Asked in Traffic Survey

ELEVEN western states, including California, in cooperation with the U. S.

Bureau of Public Roads are now ascertaining facts with regard to highway use on routes within their borders. The public is well aware that modern highway programs are based upon knowledge of transport conditions and is doing its share in assisting state and federal officials to secure the basic facts.

The success of the traffic survey now under way is to a large extent dependent upon the replies of motorists to questions upon cards now being distributed at more than 850 points. These replies are numbered in hundreds of thousands and, despite the fact that no postage is needed to return the card a large number of those mailing them have shown their interest to the extent of attaching full postage. Some, apparently feeling that more information might be desired, have taken the trouble to write lengthy and careful letters to accompany the cards.

It is undoubtedly true that no inquiry covering such a mass of the public, could fail to elicit some replies in which the American characteristic of humor is displayed. In reply to the question—"How many passengers, including driver?" one reply stated "two, some bedding, two grips and a dog." Some are not in a humorous frame of mind, as shown by the remarks "Two punctures in good tires," while others request specific improvement in their own localities. The majority, again in characteristic American fashion, furnish the full information as requested.

The replies to the cards are being supplemented by full reports from the traffic survey personnel. The combined information will be of prime importance in the solution of many of the problems of highway administration. The determination of the actual use of the various highways—the number of persons as well as the number of each type of motor vehicle traveling over each route—is the first objective. Intelligent relocation of routes, where necessary, is made possible upon the basis of the reported information. Design of highways, particularly upon heavy trucking routes, is affected by the traffic reports. The distribution of expenditures for maintenance, particularly for snow removal, and the advisability of its extension, are vitally affected by

(Continued on page 24.)

THE BALLAD OF THE BACK SEAT DRIVER

From the Oakland Tribune.

I

'Twas at a crowded crossing—
Crowds hastened to the spot
Whence came a cry of anguish
And one loud pistol shot.
Inside an automobile
There lay a woman dead;
Beside it stood the driver
Who with emotion said:

Chorus

"I am the lady's husband;
Long years have we been wed.
I loved her very dearly
And shot her through the head.
I p'raps should not have killed her—
It is not right to slay—
But with these back-seat drivers
It is the only way!"

II

As crowds then swarmed about him
He knelt beside his wife
And said: "My sweet you forced me
To turn and take your life;
You gave too many orders
On each and ev'ry ride."
Then, summoning a copper,
He very softly cried:

Chorus

III
They took him to the housegown
And threw him in a cell,
"If you'd kept still," he muttered
"You'd be alive and well.
You'd always give directions
To stop or turn or go"—
Then calling to the sergeant
He cried: "I'd have you know":

Chorus

IV

All night he lay and muttered:
"I'm very sorry, dear,
But, sweet, you drove me nutty
By shouting in my ear.
When I would take a north road
You'd say: 'The right road's south'"
Then to a chief detective
These words came from his mouth:

Chorus

V

To the court he soon was taken,
Where, mopping up a tear,
He sobbed: "She drove me to it
By orders from the rear.
In most confusing traffic
She'd bellow what to do,
And as I told the others
I also say to you":

Chorus

VI

"She'd tell me when to light up
And when to blow your horn,
And shriek 'Your brakes are burning
I know the bands are worn!"
She'd call me down for coasting
And criticize the way
I'd turn around in traffic—
And so, dear judge, I say:

Chorus

VII

"On week-day or on Sunday
She'd tell me where to go,
And bawl me out for speeding
And squawk if I went slow.
She'd criticize the routes that
I'd pick to reach the shore;
She never kept her mouth shut—
And as I said before":

Chorus

VIII

The judge and jury listened,
Then rose and set him free.
"Your act was justified," they
Said, "we do agree.
We know how much you suffered,
How tortured was your mind
Each time you took her driving,
And this is what we find:

Chorus

"You were the lady's husband!
Long years ago you wed.
You loved her very dearly,
And shot her through the head.
You p'raps should not have killed her
It is not right to slay—
But with these back-seat drivers
It is the only way."

EARTHENWARE

Boasting of our wealth and virtues rare,
What are we but bits of earthenware?
Fashioned by the one Great Master Hand,
Each one marked by that Great Maker's brand,
Some of us are fashioned tall and fair,
Vases for the mansion, Dresden Ware;
Some of us as ornaments are prized;
Some of us are useful—yet despised;
Some of us are "big pots" lined with gold,
Some of us are "mugs" and bought and sold;
Some of us are "broke"—ah, that's a fact;
Some of us are not "broke," only "cracked."
Some of us are fashioned fine and true,
With every ray of sunshine gleaming through;
Some of us are coarse and chipped and stained—
Yet fragrant with the balm of love contained,
Earthenware, just earthenware, vessels of clay,
just earthenware;
All of us made by the one Great Potter;
Some of us as white as porcelain, some as brown
as terra cotta;
Earthenware, just earthenware, that the Master
will repair
When we go to the clay that we came from,
some day—
Broken earthenware.—George Wood.

Santa Ana River Report Now Ready For Distribution

Bulletin 19 of the Division of Water Resources, entitled "Santa Ana Investigation," and dealing with flood control and conservation problems in the Santa Ana River Basin, has been received from the State Printer and is available for distribution.

The report is the result of an intensive investigation that was first undertaken in 1925 at the request of Orange, Riverside and San Bernardino counties whose citizens realized the importance of their perplexing water problems and requested the State of California to assist them in finding a remedy. This resulted in the passing of a state appropriation of \$25,000 to be expended during the fiscal period 1925-1927, on the condition that the three counties concerned provide an equal sum toward the work. The required cooperation was obtained, and the State Engineer was instructed to carry out the study in conjunction with an advisory committee of engineers appointed by the counties.

The principal source of water for these counties is the Santa Ana River and its tributaries whose total annual water crop has been estimated in excess of four hundred thousand acre-feet. This water occurs largely in the form of torrential floods during the winter, followed by extremely low stages in summer when it is most required. The winter floods frequently occur in such volume that great damage is caused in their rush toward the sea.

The legislature of 1927 appropriated an additional sum of \$40,000 for continuing the survey and publishing a report, provided that interested parties contribute an equal amount for such purpose. Final work of assembling the data gathered during the investigation was actively taken up in October, 1927. This latter phase of the investigation and the report were under the supervisory charge of Harold Conkling.

This bulletin contains a complete study and suggested solutions for flood control on the watershed of Santa Ana River. It embraces a detailed compilation of statistical information, a description with cost estimates of fifty possible unit structures and illustrative combinations of works for consideration of public bodies in carrying out the program.

The report indicates that flood control may be successfully achieved and that its extent

March 1st Report On Snow Survey Data is Issued

THE following progress report of the snow survey and precipitation data covering the period to March 1, 1930, has been issued by the Division of Water Resources:

Using the data from precipitation stations, a comparison of conditions to March 1st with normal shows, in general, that the precipitation in the northern stream basins from Upper Sacramento to Yuba is from normal to 10 per cent below normal with the exception of Feather Basin which shows about 10 per cent above normal. In the central basins from the American to the Merced, the precipitation ranges from about 15 per cent to 35 per cent below normal, and in the southern basins from the Upper San Joaquin to the Kern, the precipitation to March 1st is entirely below normal and ranges from about 35 per cent to 45 per cent below.

As stated in the February bulletin, there are only a few snow courses where surveys have been made over a period of years so that comparison with the results of previous years and reference to normals can be made. In the Tahoe Basin recent surveys at Marlette Lake show a water content of 61 per cent of the entire seasonal normal (October to May) as compared to 38 per cent up to the time of the February report. In the Yuba Basin, courses at Summit and Lake Fordyce show a water content of 52 per cent of the entire seasonal normal and in the Mokelumne Basin the crest course at Blue Lakes shows a water content of 54 per cent of the entire seasonal normal.

This is the second bulletin covering snow survey and precipitation data. As stated at the issue of the first bulletin in February, this is the first season that comprehensive snow surveys have been undertaken by the state and pursuant to an act and appropriation of the last legislature, one hundred and fifty "snow course" locations have been made throughout the Sierra. All of these courses will be surveyed about the first of April to furnish the data upon which the estimates of the April-July stream flow may be made. In each major stream basin, however, certain "key" courses have been selected at which the surveys are made at approximately monthly intervals from June to May. Prior to the main surveys about April 1st therefore, these monthly bulletins are issued to present the results of the key course surveys and to give also the data on the seasonal precipitation to date as reported from the stations of the U. S. Weather Bureau, state and private agencies located in the mountainous portions of the stream basins.

is largely dependent on the amount which public bodies eventually decide to appropriate for this purpose. Work is still being continued by the state on certain phases of a conservation and flood control program, notably spreading works on the debris cones. These are in process of being mapped in detail both by aeroplanes and topographic surveys in order to prepare the way for detail plans.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MEEK.....Director
GEORGE C. MANSFIELD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 8 MARCH, 1930 No. 3

ASK ME ANOTHER

A contractor reports the receipt of the following letter from an indignant citizen who lived nearby:

"Why is it that your steam shovel has to ding and dong and fizz and spit and bang and hiss and pant and grate and grind and puff and chug and hoot and toot and whistle and wheeze and jar and jerk and howl and snarl and groan and thump and boom and smash and jolt and screech and snort and slam and throb and roar and rattle and yell and smoke and smell and shriek and fume and crash all day long?"

This would seem to be a rather difficult question to answer offhand.—*Iowa Engineer.*

TRAFFIC VIEWS OF PUBLIC ASKED IN TRAFFIC SURVEY

(Continued from page 21.)

traffic conditions. The development of a program of improvement, and the setting up of a highway expenditure budget in accordance with present and expected future traffic demands, are based upon knowledge of transport conditions.

The cooperative traffic survey will result in information secured under uniform conditions in eleven states, will make possible comparisons of conditions on interstate routes in adjoining states, and should facilitate agreements between states for the improvement of interstate connections. The important routes throughout a territory comprising over 40 per cent of the area of the United States, may be selected upon the basis of traffic facts. Not only interstate, but international, cooperative highway improvement will be made easier as a result of the securing of such primary information with regard to highway transport.

MICHIGAN—Surfacing improvements of all sorts on state highways totaled 656 miles for the 1929 season.

REDUCING THE HAZARD FROM FIRES STARTING ALONG STATE HIGHWAYS

(Continued from page 2.)

port and handle all fires adjacent our highways within national forests, pending their relief by the proper forest official with adequate forces. In the case of fires for which our employees were not responsible the agreement provided for reimbursement of the state at the going fire fighting rates for labor and equipment.

A similar agreement affecting areas adjacent to state highways within the state forests was also concluded this year between the Division of Highways and the Department of Natural Resources, Bureau of Forestry, on request of State Forester M. B. Pratt.

These two agreements we are assured are very beneficial, as assistance is provided at the most critical period.

In addition to this cooperation, we have during the past two years been carrying on an active clean-up program within our rights of way through forested areas. To date this work has been undertaken on the Alturas, Susanville and Trinity laterals, the Placerville-Lake Tahoe, Auburn, Big Oak Flat, Kit Carson, Ebbetts Pass, Sonora Pass, Pacific, Redwood and Downieville highways. You will appreciate, I am sure, that this work must of necessity spread out over a period of years, due to the extensive territory involved. The importance of this work has been recognized, and special provisions concerning clearing have been written in all construction contracts within forest areas.

When courage fails and faith burns low
And men are timid grown,
Hold fast thy loyalty and know
That Truth still moveth on.
Who follow her, though men deride
In her strength shall be strong,
Shall see their shame become their pride,
And share her triumph-song!

—Hosmer.

A lawyer received the following letter from a client:

"Dear Sir: My boy got struck by an automobile, number 6B-4872. If the owner is rich, sue him at once. The boy wasn't bruised any, but on your notifying me that you have brought suit, I will hit him in two or three places with a hammer.—*Missouri Pacific Magazine.*

NEW ENGLAND—The traffic capacity of the famous old Boston Post Road from New York to Boston was doubled when this highway was widened from two to four traffic lanes.

WINTER TRAFFIC COUNT ON STATE HIGHWAYS

(Continued from page 5.)

Station location	January, 1929		January, 1930		Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Belvedere Je. R. 52 to Belvedere, S. on 1.....	5,554	2,941	4,562	2,850	Holuch Bridge, North Bound			161	81
E. on 52.....	1,186	883	704	442	South Bound			145	58
N. on 1.....	4,743	2,319	4,293	2,692	Oregon Line	126	104	76	41
San Rafael N. of Cy. at top hill	4,019	1,853	3,594	2,342					
Petaluma S. Cy. Lts. at Malint. Yd.	2,897	1,638	2,200	1,965					
Petaluma N. of Cy.		Road closed	3,333	4,463					
Catati at Jct. C.R. to Sebastopol, S. on 1.....		Road closed	2,359	2,035					
W. on C.R.		Road closed	692	512					
N. on 1.....		Road closed	1,807	1,575					
Santa Rosa S. of Cy. at Tri- angle Service Sta.		Road closed	2,390	2,078					
Santa Rosa N. of Cy. at S. P. R. R. Xing.	3,414	2,854	2,994	2,389					
Headsburg, S. of Cy. at N. W. P. R. R. Xing.	1,561	1,394	1,915	1,400					
McCray's Jct. C.R. to Preston, S. on 1.....	776	566	815	615					
E. on C.R.	217	117	160	154					
N. on 1.....	570	423	656	495					
McDonald at Jct. Rt. 48 to Boonville,									
S. on 1.....	475	372	541	422					
W. on 48.....	148	112	163	122					
N. on 1.....	405	272	379	304					
Hopland at Jct. Rt. 16 to Lake- port,									
S. on 1.....	666	597	449	631					
E. on 16.....	494	476	495	392					
N. on 1.....	1,142	1,044	834	981					
Ukiah S. of Cy. Lts. Jct. with Rt. 70,									
S. on 1.....	985	747	804	712					
E. on 70.....	822	651	529	651					
N. on 1.....	1,627	1,286	1,176	1,283					
Ukiah N. of Cy. Lts. at Jct. Rt. 15 to Colusa,									
S. on 1.....	1,277	945	1,042	753					
E. on 15.....	518	378	377	311					
N. on 1.....	887	646	752	490					
District I									
Willits N. of Cy. at Jc. C.R. to Sherwood,									
S. on 1.....	538	407	453	367					
W. on C.R.	59	59	64	23					
N. on 1.....	479	351	394	342					
Mendocino-Hum. Co. Line, Garberville at Jc. with C.R. to Briceiland,	165	113	196	115					
S. on 1.....	416	299	238	259					
W. on C.R.	135	121	73	77					
N. on 1.....	508	391	330	320					
Dyerville at Jc. C.R. to S. Fork, S. on 1.....	510	361	394	313					
E. on C.R.	225	263	145	177					
N. on 1.....	465	325	358	312					
W. on C.R.	45	45	10	26					
Fernbridge Jc. C.R. to Ferndale, S. on 1.....	1,838	1,680	788	524					
W. on C.R.	1,055	690	402	328					
N. on 1.....	1,784	1,069	747	496					
Eureka S. of Cy. Lts., Eureka N. at Eureka Slough Bridge,	3,279	2,321	2,329	1,773					
Arcaata N. of Cy. at Jc. Rt. 20 to Weaverville,	2,256	1,559	2,330	1,665					
S. on 1.....	737	516	1,243	734					
E. on 20.....	811	560	563	360					
N. on 1.....	174	76	726	385					
Arcaata at Mad River Store, N. on 1.....	230	152							
S. on C.R.	988	723							
N. on 1.....	1,043	736							
Orick, Jc. Rt. 1 and C.R. to Weitchpec,									
S. on 1.....	242	152	183	149					
E. on C.R.	32	13	21	13					
N. on 1.....	223	141	169	103					
Klamath River Bridge, Crescent Cy. S. E. of Cy. at Jc. Rd. to Crescent Cy.,	226	182	194	129					
S. on 1.....	597	606	467	429					
N. to C. C.	851	805	819	631					
E. on 1.....	475	376	522	329					

Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Holuch Bridge, North Bound			161	81
South Bound			145	58
Oregon Line	126	104	76	41

Route 2. San Francisco to San Diego

District IV

Colma Jc. with Rd. to S. San Francisco,				
N. on 2.....	20,696	8,842	14,893	7,695
E. on C.R.	3,553	1,943	2,133	1,737
S. on 2.....	17,073	6,893	12,764	5,956
San Bruno Jc. with Bay Shore Rd. to S. San Francisco, N. W. on 2.....	16,560	6,662	11,743	5,533
N. E. on C.R.	1,726	1,424	1,712	2,027
S. on 2.....	18,286	8,886	13,455	7,562
San Mateo S. of Cy. at 16th Ave. Redwood Cy. N. of Cy. Lts.,	18,956	8,896	14,846	8,880
Palo Alto at Highway to Federal Tel. Sta.	17,309	8,072	12,661	8,666
9 MI. N. of San Jose, N. on 2.....	11,667	5,682	9,538	7,044
W. on C.R.	5,980	3,446	3,938	6,272
S. on 2.....	1,825	1,111	1,290	1,085
5 MI. N. of San Jose,	7,441	4,430	7,242	6,333
4 MI. N. of San Jose,	7,020	4,217	6,693	5,873
San Jose N. of Cy. Lts. at Lum- ber Yard	9,453	7,455	8,390	9,288
San Jose S. of Cy. Lts.,	17,069	17,836	14,370	20,760
5 MI. S. of San Jose,	6,367	5,904	5,915	5,306
10 MI. S. of San Jose,	4,751	2,783	3,563	3,175
15 MI. S. of San Jose,	4,696	2,915	3,718	3,151
15 MI. S. of San Jose,	4,638	2,734	3,621	3,223
Gilroy N. of Cy. at Jc. with Mt. Madonna Rd. to Watsonville,				
N. on 2.....	4,968	3,841	4,443	4,654
W. on C.R.	748	618	750	727
S. on 2.....	4,985	3,982	4,531	4,671

Route 2. District V

San Juan Bautista, N. of Cy. at Jc. with R. 67 Chittenden Rd., N. on 2.....	2,714	1,727	2,589	2,199
W. on 67.....	1,763	949	1,404	1,051
S. on 2.....	2,238	1,529	2,225	2,069
San Juan Bautista, S. of Cy. at Jc. Rt. 22 to Hollister,				
N. on 2.....	2,428	1,766	2,431	2,160
E. on 22.....	1,639	918	1,494	1,338
S. on 2.....	1,831	1,255	2,067	1,603
S. Bt.-Mon. Co. Line, Salinas N. of Cy. Lts.,	1,776	1,010	1,867	1,627
Salinas S. of Cy. Lts.,	3,850	2,548	2,930	3,151
Gonzales 3 MI. W. of Town, Soledad S. of Milk Plant,	2,388	2,391	2,117	2,610
San Lucas S. of Cy. at Jc. R. 10 to Coalinga and C.R. to Jolon,	1,699	1,405	1,628	1,729
N. on 2.....	1,582	1,371	1,585	1,734
E. on 10.....	930	821	1,151	1,155
W. on C.R.	106	115	75	92
S. on 2.....	84	174	54	127
Paso Robles N. of Cy. Lts.,	860	813	1,079	1,066
Paso Robles S. of Cy. Lts.,	1,154	954	1,164	1,203
San Luis Obispo N. of Cy. Lts., at R. R. Xing.	1,759	1,282	1,581	1,850
San Luis Obispo S. of Cy. Lts., at R. R. Xing.	2,001	1,418	1,916	1,726
Santa Maria N. of Cy. at Jc. R. 57 to Bakersfield,	3,345	2,260	2,650	2,768
N. on 2.....	2,155	1,222	1,372	1,929
E. on 57.....	165	65	201	79
S. on 2.....	2,209	1,235	2,073	1,981
Buellton at Intersection with Co. Rds. W. to Lompoc and East- erly,				
N. on 2.....	1,240	855	1,291	1,329
E. on C.R.	369	318	210	245
W. on C.R.	397	274	208	256
S. on 2.....	1,453	993	1,325	1,435
Gaviota W. on Rd. to Gaviota Sta.	1,467	894	1,407	1,411
Orellia, opposite Orellia Station, Santa Barbara W. of Cy. at Jc. San Marcos Rd.,	1,692	941	1,428	1,457
N. on 2.....	4,488	2,800	3,218	2,731
On San Marcos Rd.,	833	346	1,049	571
S. on 2.....	4,738	2,852	3,694	3,880
Santa Barbara W. of Cy. Lts., on 2.....	5,993	3,980	4,371	5,635
Santa Barbara 300 Ft. E. of Cy. Lts.,	8,736	7,828	5,733	7,074
Santa Barbara-Ventura Co. Line	4,906	2,282	3,191	3,154

Route 2. District VII

Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Ventura W. of Cy. at Bridge...	6,221	2,999	3,378	3,523
Ventura E. of Cy. Lts.	6,653	4,316	4,263	5,102
El Rio Intersection.				
N. on 2.....	6,050	2,690	3,763	3,133
N. to Saticoy.....	1,125	874	912	1,133
S. on 60.....	3,494	2,471	2,860	3,616
E. on 2.....	2,203	1,394	1,970	1,949
Ventura Los Angeles Co. Line.	5,903	2,182	2,111	1,797
W. of Hollywood-Ventura Blvd.				
at Sepulveda St.	11,270	5,270	4,628	5,368
L. A. E. at Indiana St.	25,438	21,322	10,458	14,270
Whittier at Je. with Hadley St.				
W. on 2.....	20,644	14,656	11,619	14,012
N. on Hadley.....	4,413	4,130	2,806	3,894
E. on 2.....	20,538	10,781	9,185	8,947
La Habra E. of Cy. Lts. at Je. Rds. to La Habra and Brea.				
N. on 2.....	8,333	4,337	3,824	3,141
W. to La Habra.....	3,430	2,102	2,334	2,257
E. to Brea.....	3,420	2,102	2,334	2,257
S. on 2.....	9,345	5,068	3,344	3,962
Anaheim N. of Cy. Lts.	12,744	8,054	7,131	8,881
Santa Ana N. of Cy. at Je. C.R. to Orange.				
N. on 2.....	10,465	5,916	5,804	6,687
E. on C.R.....	7,554	5,468	4,560	4,796
S. on 2.....	11,826	7,309	6,756	8,142
Tustin W. of Cy.....	7,261	5,000	3,562	4,390
Serra Jet. Rt. 60.				
N. on 2.....	4,377	2,032	1,971	1,687
W. on 60.....	4,493	1,636	1,895	1,873
S. on 2.....	7,058	2,902	3,410	2,493
Oceanside Nr. S. Cy Lts.	6,768	3,729	3,977	3,508
Delmar at S. P. R. R. Xing.	5,923	2,672	3,354	2,590

Route 3. Sacramento to Oregon Line

District III

Sacramento N. at Je. Garden Highway.				
W. on 3.....	9,540	9,835	9,288	9,723
N. on Garden Highway.....	740	865	607	724
E. on 3.....	8,443	8,823	8,951	9,302
Ben All Xing Je. C.R.				
N. on 2.....	4,329	2,914	4,972	3,383
N. on C.R.....	310	251	374	324
S. on C.R.....	544	399	373	683
E. on 3.....	4,138	2,776	5,318	2,844
Je. C.R. to Folsom, N. of 12 MI House.				
S. on 3.....	3,265	2,136	4,440	2,031
E. on C.R.....	528	196	407	218
N. on 3.....	3,041	1,995	4,733	2,131
Roseville S. of Cy. Lts.	3,812	2,726	5,149	2,725
Roseville N. of Cy. Lts.	1,514	1,338	1,246	1,297
Marysville S. of Cy. at Je. Ham- monton Rd.				
S. on 3.....	1,528	1,238	1,064	1,019
Hm. Rt. 3.....	951	607	423	602
N. on 3.....	2,295	2,052	1,570	1,798
W. on C.R.....	322	323	253	339
Yuba City N. of Cy. at Je. Rt. 15.				
S. on 3.....	2,628	2,801	2,102	2,533
W. on 15.....	1,423	1,456	1,187	1,405
N. on 3.....	1,606	1,608	1,396	1,647
Richvale Wye Je. Rt. 21 to Oro- ville.				
S. on 3.....	596	650	709	574
W. on 3.....	568	564	586	521
E. on 21.....	313	264	319	291
Chico at Je. C.R. E. to De Sabla.				
S. on 3.....	2,678	1,657	1,588	1,386
E. on C.R.....	257	270	185	135
N. on 3.....	2,257	1,876	1,719	1,493
Chico N. of Cy. at Je. C.R. East.				
S. on 3.....	1,212	1,180	981	1,004
E. on C.R.....	200	124	141	112
N. on 3.....	1,085	1,081	883	933

Route 3. District II

Butte-Tehama Co. Line	583	504	316	352
Red Bluff E. at Je. with Rt. 29 to Susanville.				
S. on 3.....	878	745	767	851
E. on 29.....	261	260	317	287
N. on 3.....	985	836	629	826
Cottonwood S. of Town at Te- hama-Shasta Co. Line.....	1,016	766	742	743
Redding S. of Cy. at Je. with Rt. 28 to Alturas.				
S. on 3.....	852	878	882	830
E. on 28.....	468	488	269	285
N. on 3.....	1,172	1,081	1,100	1,081

Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Redding 3 MI. N. at Je. with C.R. to Kennett.				
W. on 3.....	624	463	215	116
N. on C.R.....	48	19	11	17
N. on 3.....	590	467	186	129
Gibson-Boulder Creek Maint. Yard				
N. on 4.....	523	450	354	306
Dunsmuir 1.5 MI. S.	737	647	455	317
Dunsmuir N. Cy. Lts. at Br.	1,659	1,192	810	748
Dunsmuir 4 MI. N. at Mott.	1,266	687	553	472
Weed Je. with Klamath Falls Road	59	40	44	11
Gazelle 1 MI. N.	721	532	485	437
Yreka S. Cy. Lts.	1,153	1,015	932	789
Je. with Rt. 46, S. of Horn- brook.				
S. on 3.....	480	375	382	305
N. on 46.....	103	86	87	63
N. on 3.....	492	372	396	303
Oregon Line	524	366	387	343

Route 4. Sacramento to Los Angeles

District X

Sacramento S. of Cy. Lts.	5,167	4,698	4,370	4,852
? MI. House at Intersection Florin Rd.				
N. on 4.....	2,741	2,090	2,649	2,567
E. on C.R.....	583	482	490	515
W. on C.R.....	70	51	70	82
S. on 4.....	2,517	1,864	2,460	2,321
Old Elk Grove at Intersection Franklin-Elk Grove Rd.				
N. on 4.....	2,268	1,763	1,945	1,886
E. on C.R.....	673	622	402	610
E. on C.R.....	379	315	288	317
S. on 4.....	1,866	1,365	1,609	1,525
Twin Cities Je. Rt. 34 to Jack- son.				
N. on 4.....	1,723	1,267	1,706	1,632
E. on 34.....	1,776	1,341	1,721	1,671
Je. S. H. and C.R. to Stockton.				
N. on 4.....			1,503	1,374
S. on 4.....			1,260	1,122
S. W. on C.R.....			268	256
Lodi Je. Rt. 24 to San Andreas.				
N. on 4.....	2,129	1,827	1,938	1,802
E. on 24.....	1,262	1,085	1,007	1,042
S. on 4.....	3,101	2,455	2,512	2,381
Cherokee Station.				
N. on 4.....	1,513	1,486	1,811	1,918
E. on C.R.....	655	524	214	187
N. on 4.....	1,677	1,233	1,825	1,868
Stockton S. of Cy. Je. of Mari- posa Road.				
W. on 4.....	1,914	1,593	1,652	1,680
E. on C.R.....	864	569	716	496
N. on 4.....	1,073	1,026	954	1,186
Turner's Sta. Intersection of Rt. 4 and C.R.				
N. on 4.....			1,029	1,188
S. on 4.....			690	826
E. on C.R.....			270	384
Manatee N. of City.....	2,052	2,025	1,634	2,124
Ripon N. of City.....	3,232	2,437	2,522	2,547
Salida Je. Rt. 13 to Sonora.				
N. on 4.....	3,317	2,390	2,741	2,667
E. on 13.....	203	211	194	171
S. on 4.....	3,439	3,521	2,774	2,723
Modesto N. of Cy.....	4,869	4,297	3,855	4,499
Modesto S. of Cy. Je. Crows Landing Rd.				
N. on 4.....	5,900	5,920	5,948	7,351
W. on 4.....	4,582	4,166	3,957	5,047
S. on 4.....	1,945	2,211	1,829	2,759
Turlock N. of City.....	3,238	2,798	2,799	3,088
Turlock S. of City.....	3,042	2,460	2,568	2,676

Route 4. District VI

Stanislaus-Mer. Co. Line.....	2,840	2,931	2,064	2,448
Atwater N. of City.....	2,401	2,078	1,916	2,101
Merced E. Cy. Lts. at Bridge.....	3,426	3,282	2,694	3,253
Merced S. Cy. Lts. at Bridge.....	2,386	2,566	2,036	2,561
Merced-Madera Co. Line.....	1,677	1,393	1,337	1,397
Califa Je. Rt. 32 to Gilroy.				
N. on 4.....	1,628	1,411	1,390	1,545
W. on 32.....	514	344	481	470
S. on 4.....	1,865	1,723	1,652	1,748
Madera N. of City.....	2,671	2,288	2,252	2,806
Madera-Fresno Co. Line.....	2,833	2,429	2,379	2,509
Muscatel	3,200	2,809		

Station location	January, 1929		January, 1930		Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Fresno N. of Cy. W. of S. P. R. X. Ring at Je. Olive Ave., N. on 4.....	3,999	3,769	3,242	4,143	Mossdale Jc. Rt. 66 to Manteca N. on 5.....	1,878	1,422	1,986	1,837
E. on Olive.....	1,108	695	1,342	817	E. on 66.....	1,949	1,121	1,855	1,387
S. on 4.....	3,962	3,851	3,362	4,250	S. on 5.....	3,812	2,494	3,839	3,222
W. on Olive.....	461	334	810	624	Jc. of S.H. & C.R. to Bethany, E. on 5.....	.....	.....	3,619	2,744
Fresno, S. of Cy. at Je. Church Are. on 4.....	7,084	7,149	5,946	8,095	N. W. on C.R. to.....	.....	.....	356	401
Malaga, S. of R. R. Sta.....	4,847	4,498	4,173	5,383	W. on 5.....	.....	.....	3,313	2,363
Fowler S. of City.....	3,161	2,674	2,609	3,113	Tracy W. of Cy. at Je. C. R. to Byron Sta., E. on 5.....	3,735	1,904	.....	.....
Selma S. of City.....	2,834	2,346	2,470	2,962	N. on C.R.....	131	97	.....	.....
Kingsburg S. of Cy. Nr. Kings River Bridge.....	2,171	1,711	1,765	2,151	W. on 5.....	3,765	1,888	.....	.....
Goshen Jc., Je. Rt. 10 to Han- ford and C.R. to Tulare, N. on 4.....	1,986	1,892	1,705	1,941	Route 5. District IV				
W. on 10.....	1,017	1,091	1,014	923	Altamont at R. R. Sta.....	3,867	2,002	3,501	2,292
S. on 4.....	1,853	1,678	1,597	1,594	Livermore E. of Cy. at Je. C.R. to Livermore, E. on 5.....	4,207	2,422	3,499	2,687
E. on 4.....	1,270	1,286	1,310	1,365	S. on C.R.....	1,175	948	1,027	985
Visalia Wye, Je. Rt. 19 to Visalia, W. on 4.....	1,827	1,822	1,845	2,074	W. on 5.....	3,959	1,474	2,533	1,728
E. on 10.....	2,868	2,863	2,926	3,293	Santa Rita Inn Jc. C.R. to Pleasanton, E. on 5.....	4,052	2,074	3,934	2,240
S. on 4.....	1,289	1,277	1,272	1,410	S. on C.R.....	1,233	533	695	486
Tulare S. City Lts., E. on Co. Rd.....	.....	.....	1,983	2,458	W. on 5.....	4,267	2,266	4,367	2,459
W. on C.R.....	.....	.....	239	346	Dublin Jc. C.R. to Martinez, N. on 5.....	4,588	2,173	4,491	2,383
S. on 4.....	2,334	2,123	1,979	2,370	E. on C.R.....	1,445	478	1,691	578
Tipton at Intersection C.R. to Porterville, N. on 4.....	1,956	1,787	1,562	1,814	W. on 5.....	5,064	2,208	5,233	2,361
E. on C.R.....	285	335	276	349	Dublin Jc. C.R. to Niles, E. on 5.....	5,519	2,207	5,177	2,623
S. on 4.....	1,950	1,790	1,532	1,861	S. on C.R.....	444	164	631	253
Between Earlimart and Delano, Delano Intersection C.R. to Por- terville, S. on 4.....	1,940	1,758	1,473	1,602	W. on 5.....	5,303	2,200	5,225	2,608
N. on 4.....	2,222	2,069	1,713	1,870	Hayward Jc. with Castro Valley Road, E. on 5.....	6,611	2,760	5,947	3,205
N. on 4.....	2,132	2,087	1,763	1,849	N. W. to Castro Valley.....	1,109	751	1,331	1,103
E. on C.R.....	343	292	251	300	S. W. on 5.....	5,503	2,009	4,515	2,101
Famosa Jc. Rt. 33 to Paso Robles, N. on 4.....	1,915	1,756	1,333	1,423	At Alameda Co. Hospital.....	6,901	2,737	6,189	2,731
W. on 33.....	257	196	580	575	Hayward S. of Cy Lts.....	4,810	2,525	3,262	2,526
S. on 4.....	1,953	1,769	1,423	1,528	Niles N. at Hotel Bevelor.....	4,313	2,112	2,535	2,188
Saco at Saco Garage.....	2,129	2,158	1,737	1,824	Niles at Jc. Niles Canyon Road, N. on 5.....	3,366	2,308	3,363	3,014
Bakersfield N. of Cy. at Jc. C.R. to Oil Center, N. on 4.....	2,668	1,991	2,879	3,286	E. on C.R.....	1,167	561	1,009	1,030
N. on C.R.....	3,512	2,512	3,816	6,100	S. on 5.....	3,407	2,124	3,078	2,740
S. on 4.....	5,013	4,184	4,319	6,331	Niles S. of Cy. at Jc. C. R. to Centerville, N. on 5.....	3,927	2,507	2,762	2,228
Intersection Brandage Lane and Rt. 4, N. on 4.....	1,684	1,526	2,523	1,586	W. on C.R.....	1,464	1,483	1,144	1,390
S. on 4.....	1,675	1,468	1,910	1,615	S. on 5.....	2,686	1,438	1,851	1,161
W. on B.L.....	719	580	735	568	Mission San Jose Jc. C.R. to Livermore, E. on 5.....	2,357	794	1,654	912
Bakersfield 6 Mi. S. at Jc. C.R. to Taft, N. on 4.....	1,441	1,293	2,054	1,209	E. on C.R.....	987	719	1,080	785
W. on C.R.....	284	261	945	677	S. on 5.....	3,308	1,403	2,469	1,599
S. on 4.....	1,635	1,162	2,133	1,266	9 Mi. N. of San Jose Jc. C.R. to Centerville, N. on 5.....	3,262	1,241	2,061	1,137
20 Mi. S. of Bakersfield at Jc. Rt. 57, Maricopa Rd., N. on 4.....	1,944	1,302	1,212	597	N. W. on C.R.....	3,870	1,542	3,446	1,960
W. on 57.....	168	79	72	69	S. on 5.....	1,032	2,722	5,502	3,099
S. on 4.....	2,039	1,369	1,215	594	5 Mi. N. of San Jose.....	7,889	3,319	4,434	4,226
Lebec N. of Station.....	2,101	1,469	1,149	597	San Jose N. of Cy. at Jc. with Gish Road.....	5,734	2,847	4,257	3,631
District VII					San Jose W. of City at Sani- tarium.....	7,054	6,421	6,121	8,171
Liebre Mt. Maint. Sta. at Neenach Road.....	2,409	1,514	169	460	Los Gatos N. of City.....	2,863	1,698	1,860	1,832
Castaic at Jc. C.R. to Santa Paula, N. on 4.....	2,740	1,838	1,898	1,187	Los Gatos S. of Cy. Lts.....	3,463	1,465	2,134	1,533
W. on C.R.....	2,252	1,057	1,519	760	Santa Clara-Santa Cruz Co. Line.....	2,281	757	1,910	718
S. E. on 4.....	4,610	2,664	2,893	1,928	Santa Cruz N. of City.....	2,217	1,049	1,371	1,074
Saugus at Jc. Rt. 23 to Mojave, N. on 4.....	7,363	4,818	3,100	1,696	Route 6. Sacramento to Woodland Junction				
E. on 23.....	7,645	2,480	7,677	2,951	District X				
S. on 4.....	11,225	5,714	8,943	3,626	West of Sacramento, W. of Underpass.....	3,561	2,773	3,011	3,078
Near Newhall at S. end of Sec. LA-4-E.....	11,650	4,336	10,476	3,748	Davis E. of Cy. Underpass.....	2,821	2,218	2,810	2,744

Route 5. Stockton to Santa Cruz via Oakland

District X				
Intersection McKinley Avenue with S.J.-4-B, E. on McK.....	1,559	1,458	.....	.....
W. on C.R.....	719	767	.....	.....
S. on S.J.-4-B.....	1,355	1,286	.....	.....
French Camp, N. on 4.....	2,050	1,755	1,787	1,994
S. W. on 5.....	1,775	1,301	1,560	1,630
S. E. on C.R.....	585	657	276	411

Route 7. Tehama Junction to Benicia

District X				
Benicia N. of City.....	477	254	822	326
Cordella Jc. Rt. 8 to Napa, S. on 7.....	514	240	235	208
W. on 8.....	2,332	1,510	2,290	1,459
E. on 7.....	2,497	1,703	2,471	1,653
Cordella Jc. C.R. to Suisun, W. on 7.....	2,698	1,885	438	330
E. on C.R.....	887	634	447	348
N. on 7.....	1,931	1,293	276	219

Station location	January, 1929		January, 1930		Station location	January, 1929		January, 1930	
	Sun.	Mon.	Sun.	Mon.		Sun.	Mon.	Sun.	Mon.
Fairfield E. of City.....	2,548	1,844	2,886	2,005	Hanford E. of Cy. at Interx.				
Dixon S. of City.....	2,228	1,576	2,308	1,836	CR N. to Kingsburg & S. to Corcoran.				
Woodland Wye, Jc. Rt. 6.					W. on 10.....	2,060	2,035	2,421	2,448
W. on 7.....	2,274	1,662	2,320	2,103	N. on C.R.	1,175	1,139	1,295	1,382
E. on 6.....	2,699	2,139	2,633	2,707	S. on C.R.	1,853	1,332	1,371	1,437
N. on 7.....	1,688	1,196	1,881	1,709	E. on 10.....	1,825	1,750	1,737	1,979
Route 7. District III					Goshen Jc., Jc. Rt. 10 N. to Fre. & E. to Visalia & C.R. to Tulare.				
Woodland S. of City.....	1,875	1,563	1,802	1,802	W. on 10.....	1,017	1,091	1,014	923
Woodland N. of Cy. at Browns Corner Jc. with C.R. W. & S.					N. on 4.....	1,886	1,892	1,705	1,941
E. on 7.....	2,145	1,839	2,079	1,947	S. on 4.....	1,853	1,678	1,597	1,584
S. on C.R.	365	300	231	179	E. on 4.....	1,270	1,286	1,310	1,365
W. on C.R.	821	730	798	813	Visalia Wye, Jc. Rt. 4 W. to Goshen & S. to Bakersfield and Rt. 10 E. to Visalia.				
N. on 7.....	1,549	1,152	1,468	1,189	W. on 4.....	1,827	1,822	1,845	2,074
Williams S. of City.....	1,123	802	1,189	867	S. on C.R.	1,289	1,277	1,272	1,410
Williams N. of City.....	918	677	847	678	E. on 10.....	2,868	2,863	2,926	3,293
Willows S. of City.....	1,287	1,444	1,057	978	Visalia E. of Cy. at Exeter Junction.				
Willows N. of City at Maintenance Yard.....	1,106	1,123	1,560	1,420	W. on 10.....	1,639	1,601	1,791	1,854
Orland N. of Cy.....	1,121	934	826	832	S. to Exeter.....	990	955	970	1,073
Route 7. District II					E. on 10.....	938	817	1,091	975
Red Bluff S. of Town at Reed Creek Bridge.....	984	990	935	870	Lemon Cove Jc. C.R. to Woodlake.				
Route 8. Ignacio to Cordelia via Napa					W. on 10.....	534	463	1,032	426
District IV					N. on C.R.	361	243	723	274
Petaluma Creek Bridge.....	1,092	377	941	432	E. on 10.....	579	434	1,508	427
Schellville Jc. Rt. 51 to Santa Rosa.					Three Rivers E. of Town at Jc. C.R. northerly.				
S. W. on S.....	1,045	481	1,117	581	W. on 10.....	313	148	1,308	231
N. on 51.....	766	360	724	411	N. on C.R.	67	51	81	62
N. E. on 8.....	641	365	792	464	E. on 10.....	230	154	1,521	231
Napa Junction, Jc. C.R. to Vallejo.					Route 11. Sacramento to Nevada Line via Placerville				
N. on 8.....	3,373	1,682	3,407	2,291	District III				
S. on 8.....	4,726	2,331	4,893	2,804	Sacramento E. of Cy. Lts.....	2,811	1,667	2,855	1,932
E. on 8.....	2,802	1,679	3,093	2,178	Perkins Jc. with C.R. to Plymouth.				
Route 8. District X					W. on 11.....	2,433	1,442	2,225	1,694
Cordelia Jc. Rt. 7.....	2,332	1,510	2,290	1,459	S. E. on C.R.	882	587	1,046	804
Route 9. District VII					E. on 11.....	1,665	920	2,442	1,063
Tujuana West of Sunset Blvd. La Crescenta W. of Penn. Ave.	7,059	2,734	6,152	3,081	Folsom W. of City, Jc. Pratt Road.				
La Canada at School St.....	10,305	4,711	5,296	3,472	W. on 11.....	1,168	723	1,501	759
Pasadena E. of Cy. Lts.....	15,104	6,961	10,553	7,140	W. on C.R.	251	109	360	200
Azusa W. City Limits.....	13,372	5,728	11,173	5,533	E. on 11.....	973	645	1,187	612
District VIII					Folsom E. of Cy. at High School.				
S. Bd. L. A. Co. Line.....	9,036	2,319	12,973	3,029	N. on 11.....	400	130	1,115	335
Uplands E. of Cy. at Jc. C.R. to Uplands.					W. on C.R.	135	50	306	132
W. on 9.....	4,412	1,401	4,738	1,712	El Dorado Jc. Rt. 85.	489	211	1,383	421
S. W. on C.R.	2,050	1,400	1,434	1,294	S. on 65.....	220	128	56	54
E. on 9.....	6,340	2,782	5,942	2,883	E. on 11.....	736	301	876	358
Uplands at Euclid Ave. Intersection.					Placerville W. of Cy.....	1,042	483	1,160	1,064
W. on 9.....	4,843	2,265	7,116	2,619	Placerville E. of City.....	1,110	553	720	519
N. on Euclid Ave.....	3,913	2,443	6,613	2,078	Headquarters Camp.....	429	62	101	40
S. on Euclid Ave.....	2,940	2,265	4,299	2,432	Between Riverton and Kyburz.			24	14
E. on 9.....	6,482	1,859	6,019	2,239	Alpine Jc.				
S. Bd. W. of City.....	6,886	4,047	5,790	3,836	W. on 11.....	Road closed		Road closed	
Route 10. San Lucas to Sequoia National Park					S. on 23.....	Road closed		Road closed	
District V					E. on 11.....	Road closed		Road closed	
San Lucas S. of City at Jc. Rt. 2.....	106	115	1,151	1,155	Jc. Rt. 38 to Lake Tahoe.				
Route 10. District VI					W. on 11.....	Road closed		Road closed	
Monterey-Fresno Co. Line.....	52	36	139	43	N. on 38.....	Road closed		Road closed	
Parkfield Jc.					E. on 11.....	Road closed		Road closed	
W. on 10.....	91	58	237	76	N. on C.R.	Road closed		Road closed	
S. on C.R.	149	75	48	42	E. on 11.....	Road closed		Road closed	
E. on 10.....	60	27	264	105	Route 12. San Diego to El Centro				
Coalinga S. of City.....	309	227	572	365	District VII				
Coalinga 3 Mi. E. at Jc. C.R. to Oilfields.					San Diego E. of City, Euclid Ave. at Cajon W. of Cy. Lts.	8,372	4,054	6,978	3,731
W. on 10.....	793	743	744	1,050	El Cajon W. of Cy. Lts.....	6,541	2,538	5,920	2,814
N. on C.R.	239	282	267	254	At Sweetwater Bridge.....	1,680	945	3,481	427
E. on 10.....	680	697	576	802	Jacumba at Jc. C.R. to El Campo.				
Oilfields at Oil King School.					W. on 12.....	772	568	Road closed	
W. on 10.....	309	299	464	424	S. on C.R.	154	123	736	417
N. on C.R.	143	154	199	209	E. on 12.....	858	836	1,691	446
E. on 10.....	176	145	329	284	Route 12. District VIII				
Kings River Bridge.....	452	443	348	348	On Imp-12-R.....	860	533	No report—Snow	
Lemoore Jc. C.R. to Lemoore.					El Centro W. of Cy. at Jc. Rt. 26 to S. Bd.				
N. on C.R.	511	423	447	562	W. on 12.....	2,401	2,229	2,901	2,158
E. on C.R.	439	414	431	459	N. on 26.....	4,441	3,912	4,598	4,563
S. on 10.....	478	374	426	406					
Hanford W. of Cy. Lts.....	1,688	1,688	1,280	1,993					

Route 13. Salida to Route 23 at Junction				
District X				
Station location	January, 1929		January, 1930	
	Sun.	Mon.	Sun.	Mon.
E. on Mulberry Lane.....	13	14	12	13
E. on Mulberry Lane.....	777	629	2,377	2,752
S. from Intex.....	5,627	5,150	5,078	4,494
Salida Jc. Rt. 4.....	203	211	194	171

E. of Saluda at McHenry's Jc.				
C.R. to Modesto.				
W. on 13.....	327	293	311	348
S. on C.R.....	1,534	1,293	1,484	1,442
N. on 13.....	1,592	1,254	1,593	1,483
E. of Oakdale.....			1,750	752
Oakdale W. of City.....	1,285	909	1,370	1,316
Mountain Pass Jc. Rt. 40 to Yosemite				
S. W. on 13.....	1,460	334	1,211	295
S. E. on 40.....	177	47	137	60
N. E. on 13.....	1,392	315	1,127	253
Sonora S. of City.....	2,272	1,413	1,736	1,029
Sonora E. at Sullivan Creek Bridge.				
E. on C.R.....	1,341	786	335	347
N. on 13.....	1,517	483	823	365
W. on 13.....	2,665	1,118	1,046	630
Jc. S.H. & C.R. at Pooleys,				
W. on 13.....			998	195
E. on 13.....			990	254
S. on C.R.....			245	98
Between Confidence and Bakers Sta.		Road closed	Road closed	

Route 13, District IX		
Jc. Rt. 23.....	Road closed	Road closed

Route 14. Albany to Martinez				
District IV				
Albany at Co. Line.....	16,753	11,917	14,666	12,259
Jct. C.R. to Richmond,				
S. on 14.....	15,138	10,793	13,210	10,931
W. on C.R.....	5,616	4,438	3,901	4,115
N. on 14.....	10,399	6,351	9,815	7,050
Jc. Franklin Canyon Road.				
S. on 14.....	5,923	3,082	5,474	3,953
E. on C.R.....	1,742	846	1,605	1,170
N. on 14.....	4,547	2,620	4,254	2,986
Crockett 1 MI. S. of City at Jc. C.R. to Crockett,				
S. on 14.....	1,073	1,088	791	907
W. on C.R.....	765	1,032	637	938
N. on 14.....	906	870	738	851
Martinez W. Cr. Lts.....	510	461	550	358
Carquinez Straits Bridge.....	3,638	1,911	3,116	2,054

Route 15. Route 1 Near Calpella to Route 37 Near Gisco			
District IV			
Ukiah N. at Je. Rt. 1.....	518	378	377
			311

District III				
Upper Lake S. of Cy. Je. C.R. to Lakeport.				
W. on 15.....	475	354	310	336
S. to C.R.....	291	231	163	179
N. on 15.....	571	472	380	399
Upper Lake Je. C.R. to Bartlett Springs.				
N. on 15.....	182	103	128	153
E. on C.R.....	1	1	6	0
S. on 15.....	190	102	122	153
Hog Hollow Jc. Rts. 49 & 15.				
E. on 15.....	29	20	11	21
S. on 49.....	122	74	85	122
W. on 15.....	119	67	78	113
Near Venada Jc. C.R. to Bartlett Springs.				
W. on 15.....	23	28	37	36
S. on C.R.....	14	6	13	6
E. on 15.....	37	46	62	45
Williams W. of City.....	561	487	329	314
Williams E. of City.....	545	469	468	423
Colusa E. of City.....	566	507	559	489
Lower Lake Jc. $\frac{1}{2}$ MI. W. of Sweet Hollow Summit				
W. on 15.....			95	103
E. on 15.....			36	40
S. on 49.....			79	105
Sutter City.				
W. on 15.....	701	620	616	667
N. on C.R.....	303	189	314	166
E. on C.R.....	350	425	309	409
S. on 15.....	681	650	671	699
Marysville E. of City.....	416	403	571	466
Sardis Rd., N. of Je. N. & S.				
E. on 15.....	191	92	169	46

Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
W. on side road.....	62	49	35	14
W. on 15.....	191	92	201	57
Grass Valley W. of City.....	961	406	233	121
Nevada City E. of City, E. on 15	242	199	100	60

Route 16. Hopland to Lakeport				
District IV				
Hopland at Jc. Rt. 1.....	494	476	405	362
Lakeport S. of Town at Jc.				
C.R. to Kelseyville.....				
N. E. on 16.....	867	906	420	459
S. on C.R.....	668	770	415	438
W. on 16.....	255	181	99	49

Route 17. Roseville to Nevada City				
District III				
Roseville E. of City.....	2,493	1,335	4,071	1,256
Auburn S. of Cy. Jc. Ophir Rd.,				
E. on 17.....	1,272	700	1,977	602
N. on C.R.....	157	194	45	91
W. on 17.....	1,387	720	2,164	622
Auburn N. of Cy. Jc. Country				
Club Road,				
N. on 17.....	552	259	762	189
E. on C.R.....	298	78	29	81
S. on 17.....	583	250	799	198
Grass Valley S. of City.....	1,011	455	1,283	305
Nevada City S. of City.....	1,221	905	512	422

Route 18. Merced to Route 40 Near Sequoia				
District VI				
Merced 1.6 Mi. at Interx. C.R.				
at 21st St.,				
W. on 18.....	1,861	1,193	1,195	1,010
E. on 18.....	1,906	1,206	1,488	1,322
W. on C. R.	763	748	354	414
Merced 12 Mi. at Interx. C.R.				
to LeGrand,				
W. on 18.....	1,067	233	739	177
S. on C.R.	79	43	50	26
E. on 18.....	1,107	239	761	174
Morman Bar at Interx. with				
C.R. to Morman Bar,				
S. on 18.....	1,287	327	714	286
E. on C.R.	192	140	14	19
N. on 18.....	1,276	340	657	188
Briceburg to Bear Creek Bridge				
on 15.....	899	126	471	100
El Portal J. County Road.				
W. on 18.....	841	152	546	184
E. on C.R.	123	106	87	75
W. on 18.....	895	122	539	156

Route 19. From Route 9 West to Claremont to Riverside				
District VIII				
Los Angeles Co. Line E. Cy.				
Lts. Pomona—Old Road....	13,269	6,793	9,560	6,053
Bet. Pomona & Ontario at Chino				
Cross Rds.,				
W. on 19, Old Road.....	13,034	5,311	9,649	5,956
N. on C.R., Old Road.....	891	291	113	81
S. on C.R. to Chino, Old Road.....	5,410	2,691	459	569
E. on 19, Old Road.....		Road Closed	9,739	6,139
East of Ontario, E. City Lts.				
at Jc. of New S. Bd-19-B with Old Road,				
N. W. on 19, Old Road....	5,624	3,295	1,991	1,645
At S. Bd-Riv. Co. Line on 19, Old Road.....	4,898	2,010	2,663	1,957
Wineville E. of City, Old Road	6,195	2,450	2,857	2,211
Riverside W. of City at Santa Ana River Bridge, Old Road.....	7,866	4,754	4,490	4,450
Los Angeles Co. Line E. City Limits Pomona, New Road			2,427	2,483
Bet. Pomona & Ontario at Chino Cross Roads,				
N. on C.R., New Road....			824	788
S. on C.R., New Road.....			809	927
E. on 19, New Road.....			1,849	1,743
W. on 19, New Road.....			2,174	1,951
East of Ontario, E. Cy. Lts. at Jc. of New S. Bd-19-B, with old Road,				
W. on 19, New Road.....			650	470
E. on 19, New Road.....			420	389

Route 20. Route 1 Near Arcata to Redding via Weaverville					January, 1929		January, 1930	
District I					Sun.	Mon.	Sun.	Mon.
Station location					13	14	12	13
Arcata N. of Cy. at Jc. Rt. 1.					811	560	726	385
Willow Creek Jc. Cr. to Hoopa.								
W. on 20.					54	31	25	18
N. on C.R.					65	65	37	37
E. on 20.					57	52	27	27
Humboldt-Trinity Co. Line.					47	49	42	39
Route 20. District II.					January, 1929		January, 1930	
					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Big Bar Vicinity.					28	35	14	12
Weaverville 3 Mi. South.					99	77	45	40
Bet. Redding & Tower House.					175	166	62	66
Route 21. Route 3 Near Richvale to Quincy					January, 1929		January, 1930	
District III					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Richvale Wye.					313	264	349	241
Oroville West of Jc. Marysville Road.								
E. on 4.							1,054	1,120
N. on 4.							644	723
W. on Marysville Road.							429	437
Oroville East of Cy.					833	752	954	827
Bidwell Bar Bridge on 21.							45	35
Miners Ranch.								
E. on 21.					100	76	155	60
S. on C.R.					200	142	246	99
W. on 21.					278	196	395	171
Berry Creek.					28	31	9	4
Meadow Valley.								
W. on 21.					28	17	25	11
N. on C.R.					42	31	25	14
E. on 21.					10	13	6	0
Quincy.					116	49	40	20
Route 22. San Juan Bautista to Route 32 via Hollister					January, 1929		January, 1930	
District V					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
San Juan Bautista S. of Cy. at Jc. Rt. 2.					1,639	918	2,431	2,160
Route 22. District IV					January, 1929		January, 1930	
					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Hollister Jc. Rt. 32.					518	249	707	334
Route 23. Saugus to Route 11 at Alpine Junction					January, 1929		January, 1930	
District VII					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Saugus Jc. with Rt. 4.					7,645	2,490	7,677	2,051
Palmdale S. of Cy. Lts.					4,193	1,237	2,818	996
Lancaster Jc. with Rt. 59 to Neenach.								
S. on 23.					2,077	1,223	1,322	1,106
W. on 59.					820	623	450	529
N. on 23.					1,604	807	962	686
Los Angeles-Kern Co. Line.					931	370	631	362
Route 23. District IX					January, 1929		January, 1930	
					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Mojave Jc. Rts. 58 and 23.					820	330	505	306
S. on 23.					144	93	47	92
E. on 53.					871	385	545	381
N. on 23.								
Mojave Jc. C.R. to Bakersfield.					959	546	542	270
S. on 23.					575	388	430	189
N.W. on C.R.					482	235	126	95
N. on 23.								
Freeman 1 Mi. N. Jc. to Rt. 57.					162	92	43	20
S. on 57.					46	41	5	20
N. on 23.					168	118	51	20
Kern-Inyo Co. Line.					141	96	21	31
Glancha Jc. C.R. to Keeler.								
E. on 23.					220	85	46	47
S. on C.R.					50	11	14	10
N. on 23.					237	74	48	44
Lone Pine S. Cy. Lts. C.R. to Keeler.								
S. on 23.					298	318	141	171
E. on C.R.					97	101	27	32
N. on 23.					378	410	121	143
Blk Pine Jr. Rt. 63 to Oasis.								
S. on 23.					177	232	132	176
E. on 63.					102	131	15	38
N. on 23.					152	147	139	156
Bishop ½ Mi. N. at Jc. C.R. N. to Laws & Dirt Road Easterly.								
S. on 23.					636	559	331	410
N. on C.R.					303	318	163	265
E. on C.R.					72	57		
W. on 23.					340	253	189	171
Leeving Jc. Rts. 40 and 23.								
On 40.					Road Closed		Road Closed—Snow	
On 23.					79	116	24	35
District X					January, 1929		January, 1930	
					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
S. of Markleville Jc. Rt. 24.								
On 23.					Road closed		Road closed—snow	
On 24.					Road closed		Road closed—snow	
Jc. S. H. and C.R. on Woodfords.								
S. E. on 23.							5	9
N. E. on C.R. to Minden.							4	9
N. W. on 23.							2	0
Picketts Jc., Jc. Rt. 34.								
E. on 23.					Road closed		Road closed—snow	
W. on 34.					Road closed		Road closed—snow	
N. E. on 23.					Road closed		Road closed—snow	
Route 24. Route 4 Near, Lodi, to Route 23, Near Silver Creek					January, 1929		January, 1930	
District X					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Lodi Jc. Rt. 4.					1,262	1,085	1,007	1,042
Jc. Rt. 24 and C.R. to Lodi.								
E. on 24.					1,631	723	1,316	728
N. on C.R.					478	298	279	282
E. on 24.					1,204	467	1,057	511
Bet. San Andreas and Valley Springs.					1,323	241	1,045	216
Jc. Rt. 24 and C.R. to Valheita.								
N. on 24.					1,186	244	421	150
S. on C.R.					181	75	65	60
W. on 24.					1,203	255	453	174
Jc. Rt. 24 and C.R. to Murphys.								
S. on 24.					1,278	235	405	118
N. on C.R.					812	176	263	137
E. on 24.					1,547	233	534	154
Route 25. Nevada City to Downieville					January, 1929		January, 1930	
District III					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
Nevada City N. of Cy.					276	184	30	57
Comptonville N. of Cy.					107	101	9	19
Downieville Jc. Rts. 25 and 36.								
W. on 25.					106	77	17	12
N. on 36.					4	2	0	0
E. on 25.					110	79	17	13
Route 26. San Bernardino to El Centro					January, 1929		January, 1930	
District VIII					Sun.	Mon.	Sun.	Mon.
					13	14	12	13
S. Bd. S. of Cy. at N end Santa Ana River Bridge, Jc. C.R. to Colton.								
N. on 26.					3,020	2,208	2,020	2,230
W. on C.R.					3,812	2,141	1,792	1,918
S. on 26.					6,708	4,092	4,398	3,690
Bet. S. Bl. and Redlands on 26 at Jc. of Hunt's Lane.								
S. on Hunt's Lane.							289	307
E. on 26.							4,510	3,677
W. on 26.							4,607	3,795
At Inters. with Mt. View Ave. W. of Redlands.								
E. on 26.					5,730	3,505	4,219	3,190
S. on C.R.					1,068	1,018	675	745
N. on C.R.					1,356	1,268	740	834
W. on 26.					5,111	3,293	4,116	3,245
Colton Ave. at W. Cy. Lts. of Redlands.							4,388	3,751
S. E. of Redlands Jc. C.R. to Yreaval R.R.								
N. W. on 26.					3,713	2,040	3,471	2,068
E. on C.R.					491	405	436	468
S. E. on 26.					3,226	1,639	3,148	2,119
At S. Bd. R.V. Co. Line.					3,239	1,545	No count—snow	
Beaumont Jc. Jack Rabbit Trail.								
N. W. on 26.					3,028	1,430	No count—snow	
W. on Jack Rabbit Trail.					1,574	686	No count—snow	
E. on 26.					4,286	1,999	No count—snow	
Rancho W. of Cy. Lts.					4,160	2,627	No count—snow	
At Jc. with C.R. to Palm Springs.								
E. on 26.					2,001	1,190	No count—snow	
S. E. to Pal. Springs.					1,739	484	No count—snow	
W. on 26.					3,398	1,501	No count—snow	
Cochella S. of Cy. at Jc. C.R. to Thermal and Mecca.								
N. on 26.					1,627	1,077	No count—snow	

Station location	January, 1929		January, 1930		Route 32. Route 2 Near Gilroy to Route 4 Near Califa			
	Sun.	Mon.	Sun.	Mon.	District IV.			
E. on C.R.	846	646	No count—snow		January, 1929			
W. on C.R.	281	221	No count—snow		Sun.	Mon.	Sun.	Mon.
S. on 26	1,271	1,055	No count—snow		13	14	12	13
1 Mi. S. of Indio at Jc. of C.R.					Station location			
S. to Coachella and Thermal and Mecca.					Hollister Jc. with Rt. 22.			
N. on 26			No count—snow		W. on 32	674	322	702
S. E. on 26			No count—snow		S. on 22	513	249	707
S. on C.R.			No count—snow		E. on 32	1,081	509	1,267
At Riv. Imp. Co. Line	1,535	1,122	1,209	863	Pacheco Pass at Santa Clara-Merced Co. Line.	1,025	428	1,155
Westmoreland, E. Cy. Lts.	2,620	2,371	2,660	2,730				459
Vendel's Service Sta. 5 Mi. W. of Westmoreland			1,299	979	Route 32. District VI			
Brawley at W. Cy. Lts. Jc. with Western Ave.					Junction-Jc. C.R. to Gustine.			
W. on 26	2,323	2,768	3,465	4,022	W. on 32	1,093	451	1,067
N. on Cy. St.	162	224	221	250	N. on C.R.	299	135	241
E. on Cy. St.	2,724	2,684	3,352	3,920	E. on 32	839	356	922
S. on Cy. St.	290	234	396	365	Crossing (Near Maint. Yard).			
Brawley, Jc. S. W. of Cy.					E. on 32		1,761	2,232
S. on 26	3,340	2,903	2,665	2,857	E. of Los Banos at Jc. C.R. to Dos Palos.			
N. on Ct. St.	3,382	2,642	2,805	3,730	W. on 32	1,189	877	1,034
N. W. on C.R.	307	234	188	191	S. on C.R.	602	568	619
El Centro W. of Cy. Jc. Rt. 12	4,441	3,812	2,901	2,158	E. on 32	1,068	762	884
					Merced-Madera Co. Line at Jc. C.R. to Merced.			
Route 27. El Centro to Yuma					W. on 32	931	530	730
District VIII					N. on C.R.	364	212	303
El Centro N. of Cy. at Jc. C.R.					E. on 32	617	351	488
N. to Brawley and S. to Calexico.					Califa Jc. Rt. 4	514	344	481
W. on 27	3,015	3,087	2,396	3,086	Route 33. Paso Robles to Route 4 Near Bakersfield			
N. on C.R.	274	236	162	265	District V			
S. on C.R.	209	204	187	266	Paso Robles E. of Cy Lts.	1,147	928	849
E. on 27	2,864	2,919	2,311	2,903	Paso Robles, ¼ Mi. E. of Cy. Lts.	617	591	586
E. of Holtville	1,728	1,621	2,206	1,992				724
Sand Hills Maint. Sta. on Rt. 27	928	580	891	657	Route 33. District VI			
Yuma at S. D. A. Plant Quarantine Sta.	2,863	1,954	2,708	2,530	S. L. O. Kern Co. Line.	139	95	367
					Blackwell's Cor. Jc. C.R. N. to Coalinga and S. to Taft.			
Route 28. Redding to Nevada Line via Alturas					W. on 33	158	102	366
District II					N. on C.R.	129	137	163
Redding S. of Cy. at Jc. with Rt. 3	468	488	269	285	S. on C.R.	108	98	154
Montgomery Creek	136	128	48	47	E. on 33	187	183	367
4 Mi. E. of Pittville at Maint. Sta.	120	54	42	23	Lost Hills Intersect. of Main St.	361	373	536
Candy	173	159	69	49	W. on 33	38	30	26
5 Mi. N. of Alturas at Jc. Lakeview Rd.					N. on Main	103	69	154
S. on 28	120	100	41	41	E. on 33	349	371	535
N. on C.R.	68	62	6	4	Wasco, Jc. Co. Rd. S. to Wasco near S. P. R. R. Xing.			
E. on 28	88	63	36	40	W. on 33	122	169	650
East of Cedarville 2 Mi.	28	25	2	10	S. on C.R.	471	456	614
					E. on 33	426	403	733
Route 29. Red Bluff to Nevada Line Near Purdy's					Fannova Jc. Rt. 4	257	196	580
District II								575
Red Bluff E. at Jc. Rt. 3	261	200	317	287	Route 34. Route 4 Near Arno to Route 23 at Picketts Junction			
Teh.-Pla. Co. Line		Road closed	47	31	District X			
2 Mi. W. of Westwood	274	123	97	68	Twin Cities Jc. Rt. 4	254	186	355
Susanville 1 Mi. W. of Town.	670	286	188	145	W. of Ione Jc. C.R. to Michigan Bar.			
Susanville, 1 M. E. of Town.	1,108	747	505	468	W. on 34	108	55	117
12 Mi. E. of Milford at Maint. Sta.	95	80	59	60	N. on C.R.	119	85	46
5 Mi. S. of Constantia at Maint. Sta.	128	88	98	78	E. on 34	215	131	142
					W. of Jackson Jc. Rt. 65 to Placerville.			
Route 31. San Bernardino to Nevada Line Near Jean					E. on 34	834	755	784
District VIII					N. on 65	605	683	602
S. Rd. of Cy. at Jc. with Mt. Vernon and Highland Ave.					S. on 34	400	186	338
S. on Mt. V.	3,892	1,601	No count—snow		Jc. S. H. and C.R.			
E. on Highland	3,325	1,832	No count—snow		S. W. on 34		71	33
W. on Highland	2,453	995	No count—snow		N. W. on C.R.		83	29
N. W. on 31	3,680	1,059	No count—snow		E. on 34		91	92
Jc. Rt. 31 with State St.					Pine Grove E. of Town.	289	119	No count
N. W. on 31	4,559	975	No count—snow		Picketts Jc. Rt. 23 on 34	No count	No count	No count
S. on State	1,491	202	No count—snow		Route 35. Peanut to Kuntz			
S. E. on 31	3,509	970	No count—snow		District II			
N. on Cajon Jc. C.R. to Swartout Valley.					At Peanut	5	7	2
S. on 31	4,508	694	No count—snow		Route 37. Auburn to Nevada Line Near Verdi			
W. on C.R.	2,756	167	No count—snow		District III			
N. on 31	1,818	603	No count—snow		Auburn E. of City.	1,388	617	2,275
Victorville S. Cy. Lts.	1,472	856	No count—snow		Colfax E. of Cy. Jc. Grass Valley Rd.			
Helendale	658	439	No count—snow		W. on 37	724	140	448
S. W. Town Lts. of Barstow.	704	483	No count—snow		N. on C.R.	146	99	190
Yermo, E. of Cy. Lts.	288	269	No count—snow		E. on 37	681	124	386
Baker	216	201	No count—snow					153
Nevada State Line	200	169	No count—snow					

	January, 1929		January, 1930		Route 44. Boulder Creek to Redwood Park			
Station location	Sun. 13	Mon. 14	Sun. 12	Mon. 13	District IV			
Emigrant Gap Jc. Rts. 15 and 37,					January, 1929		January, 1930	
W. on 37.....	Road closed		Road closed—snow		Sun.	Mon.	Sun.	Mon.
W. on 15.....	Road closed		Road closed—snow		13	14	12	13
E. on 37.....	Road closed		Road closed—snow					
Donner Lake Camp W. of Cy.					Boulder Creek at Park Line....	493	315	470
Jc. with R. 38.....								
S. to Lake Tahoe.....	Road closed		Road closed—snow		Route 45. Willows to Route 3 North of Biggs			
W. on 37.....	Road closed		Road closed—snow		District III			
S. on 38.....	Road closed		Road closed—snow		Willows E. of City.....	704	841	418
E. on 37.....	Road closed		Road closed—snow		Four Corners W. of Butte City,			
Truckee E. of Cy. at Jc. with					N. on 45.....	259	240	165
Rt. 38 to Nevada Line.....					E. on 45.....	293	229	226
W. on 37.....	296	91	134	19	S. on C.R.....	328	306	258
E. on 38.....	245	40	135	21	W. on C.R.....	152	144	107
N. on 37.....	44	13	2	1	Butte Cy. W. of Cy.,			
Nevada State Line.....	Road closed		Road closed—snow		W. on 45.....	104	79	99
Route 38. Myers to Nevada Line via Truckee River					N. on C.R.....	79	59	80
District III					S. on C.R.....	29	10	23
Truckee W. of Cy. Jc. R. 37....	Road closed		Road closed—snow		E. on 45.....	56	46	68
Truckee E. of Cy. Jc. with R. 37	245	40	.....	.....	Cherokee Canal Jc. with C.R. to			
California-Nevada State Line....	586	108	276	38	Richvale,			
Tahoe City at Jc. Rt. 39.....					W. on 45.....	92	63	128
S. on 38.....	Road closed		Road closed—snow		N. on C.R.....	76	94	53
E. on 39.....	Road closed		Road closed—snow		E. on 45.....	67	84	131
N. on 38.....	Road closed		Road closed—snow		Route 46. Route 1 Near Klamath River to Route 3 Near Cray			
Route 39. Tahoe City to Nevada State Line					District II			
District III					Weitchpec Jc. Co. Rds.....	46	45	14
Truckee City Jc. Rt. 38.....	Road closed		Road closed—snow		Thompson Creek.....	48	30	13
Near Brockway Jc. C.R. to					Cray N. of Cy. Jc. Rt. 3.....	103	86	87
Truckee on 39.....	Road closed		Road closed—snow		Route 47. Orland to Chico			
Route 40. Route 13 Near Montezuma to Route 23 Near Mono Lake					District III			
District X					Orland Jc. with Rt. 7.....	538	819	586
Mt. Pass Jc. Rt. 13.....	177	47	137	60	Glenn Bridge.....	575	291	536
1 Mi. E. of Groveland on 40.....	119	70	37	17	Chico W. of City,			
Aspen Valley Checking Station					W. on 47.....	815	830	850
on 40.....	No count				S. on C.R.....	340	330	220
Gentry Checking Station on 40	No count				N. on C.R.....	129	98	55
Mono 40 A. Jc. with Mono-23-H	No count				E. on 47.....	997	1,027	965
Route 41. District VI					Route 48. Near McDonalds to Mouth of Navarro River			
W. of Hume.....	No count				District IV			
E. of Hume.....	No count				McDonald Jc. Rt. 1.....	148	112	168
Route 42. District IV					Rooneville on 48.....	294	200	271
Waterman Switch,					Navarro, 2.3 Miles W. of Town	288	177	216
E. to Saratoga Gap on 42A.....			34	18	Route 49. Calistoga to Lower Lake			
W. to Redwood Park on 42A.....			49	16	District IV			
S. on C.R. to Boulder Creek			169	38	N. of Calistoga at Foot of Grade	321	239	2,192
Saratoga Gap at Redwood Park					Middleton Jc. Cobb Mt. Rd.			
Gate.....	Road closed—Constr.	0	4		N. on 49.....	514	438	389
Route 43. San Bernardino to Big Bear Lake					S. on 49.....	766	600	582
District VIII					W. on C.R.....	280	234	209
Foot of Waterman Grade.....	1,401	232	No count—snow		Lower Lake Jc. Kelseyville and			
Pinecrest Jc. C.R. to Lake Ar-					Lower Lake Rd.,			
rowhead.....					S. on 49.....	260	234	160
S. W. on 43.....	887	70	No count—snow		W. on L. L. R.....	466	284	234
N. E. on C.R.....	799	70	No count—snow		W. on K. Rd.....	237	186	144
N. W. on C.R.....	43	6	No count—snow		Route 51. Santa Rosa to Schellville			
E. on 43.....	107	30	No count—snow		District IV			
Running Springs Park Jc. Cy.					Santa Rosa E. of City.....	2,044	1,768	2,072
Creek Rd.....					8 Mi. E. of Santa Rosa at So-			
N. on 43.....	111	5	No count—snow		nomia Cr. Bridge.....	1,082	642	1,151
W. on Cy.-C.R.....	124	75	No count—snow		Schellville Jc. Rt. 8.....	766	360	1,117
E. on 43.....	486	69	No count—snow		Route 52. Alto to Tiburon			
W. end of Bridge over Big Bear					District IV			
Dam.....					B. Fredere Jc. Rt. 1.....	1,186	883	704
W. on 43.....	421	73	No count—snow		Richmond to San Rafael Ferry.....	980	514	
E. over Dam.....	405	57	No count—snow		Route 53. Fairfield to Lodi via Rio Vista			
N. E. on 43.....	114	40	No count—snow		District X			
1 Mi. from end of Rt. 43 Jc.					Donverton at Overhead Xing.....	309	199	341
C.R. to Pineknut.....					Itio Vista Bridge E. End,			
W. on 43.....	79	27	No count—snow		W. on 53.....	896	823	827
S. on C.R.....	105	24	No count—snow		N. on 53.....	880	794	904
E. on 43.....	139	44	No count—snow		S. on C.R.....	600	530	568
Mill Creek Lower Control—S.					Walnut Grove Bridge N. End,			
Rd. C. Jc. Big Meadows,					E. on 53.....	985	816	480
S. to Redlands.....	Road closed		No count—snow		S. on 53.....	274	267	214
E. to Big Meadows.....	Road closed		No count—snow		W. on C.R.....	1,037	989	551
N. to Big Bear Lake.....	Road closed		No count—snow		Route 53. Fairfield to Lodi via Rio Vista			
Big Bear Lake Desert Rt. Jc.					District X			
E. of Baldwin Lake.....					Donverton at Overhead Xing.....	309	199	341
N. to Desert.....	94	34	No count—snow		Itio Vista Bridge E. End,			
W. to Big Bear Lake.....	94	28	No count—snow		W. on 53.....	896	823	971
S. on E. side of Baldwin					N. on 53.....	880	794	916
Lake.....	28	6	No count—snow		S. on C.R.....	600	530	623

Station location	January, 1929		January, 1930		Station location	January, 1929		January, 1930	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Isleton Bridge East End,					Barstow Jc. Rd. E. to Standard				
N. on 53.....	207	186	155	226	Old Sta. Back of Harvey House,				
S. on 53.....	1,213	1,062	948	1,136	N.....	251	252	No count—snow	
W. over Br.....	1,022	918	839	1,008	W.....	664	552	No count—snow	
Thornton, Interx. C.R.,					E.....	191	160	No count—snow	
E. on 53.....	619	588	400	499	Train Movements at Grade Cross-				
N. on C.R.....	279	253	206	240	at Barstow.....	332	173	208	175
W. on 53.....	507	446	363	412	Daggett Jc. Arrowhead Trail Old				
Lodi N. of City.....	727	927	687	824	Trailis Hwy.,				
					N.....	262	199	No count—snow	
Route 54. Near Michigan Bar to Central House					W.....	554	457	No count—snow	
District X					E.....	273	273	No count—snow	
Central House Jc. Rt. 65 to					Vicinity Newberry Springs.....	240	200	No count—snow	
Placerville and Jackson,					Vicinity Amboy.....	141	183	No count—snow	
W. on 54.....	356	212	289	201	Near Bannock Jc. C.R. to Search-				
N. on 65.....	369	332	232	196	light,				
S. on 65.....	402	324	275	244	W. on 58.....	144	96	No count—snow	
Saratoga Gap on 55,					N. on C.R.....	36	38	No count—snow	
55 to S. F.....			221	28	E. on 58.....	186	125	No count—snow	
55 toward Woodwardia.....			3	4	Needles W. of Cy. Lts.....	681	411	No count—snow	
E. on C.R. toward Saratoga			390	62	Needles 5.7 Mi. S. Jc. to Parker				
W. on 42 toward Redwood					and Blythe,				
Park.....			0	4	S. on 58.....	156	120	No count—snow	
					S. W. on C.R.....	37	40	No count—snow	
					N. on 58.....	118	122	No count—snow	
Route 55. San Francisco to Route 5 Near Glenwood									
District IV					Route 59. Lancaster to Baileys				
Swimming Pool.....	7,925	1,274	5,016	1,191	District VII				
Jc. with C.R. to Colma,					Lancaster Jc. Rt. 23.....	820	623	450	529
N. on 55.....	4,670	375	3,172	487	Bailey Ranch.....	160	72	1	No count
E. on C.R.....	1,541	391	1,691	494					
S. on 55.....	5,201	577	3,326	738	Route 60. El Rio to San Juan Capistrano				
Jc. C.R. to Belmont at Dirt Dam,					District VII				
N. on 55.....	2,551	270	2,643	606	El Rio Jc. Rt. 2, on 60.....	3,494	2,471	2,860	3,616
S. E. to Belmont.....	1,753	196	1,090	237	Oxnard South of City Lts. on			1,784	2,017
W. to Half Moon Bay.....	2,350	376	2,751	723	Ven. 60-A.....				
Jc. with C.R. W. to Half Moon					Santa Monica Interx. Beverly and				
Bay,					L. A. 60-B Santa Ynez Can-				
N. on 55.....	2,068	373	2,761	604	yon,				
W. on C.R.....	1,214	341	718	412	W. on 60.....	12,737	2,791	1,986	1,968
S. on 55.....	980	52	2,069	197	On Bev. Blvd.....	7,152	2,791	No count	
S. (L.S. Cr. Co. Line Jc. Rts.					E. on 60.....	20,696	6,626	2,620	1,760
5 and 55.....	48	46	21	19	On Santa Monica Canyon Road.....	11,548	2,588	6,778	6,254
					Topanga Canyon on 60.....	10,167	3,164	4,098	3,767
Route 56. District V					On C.R.....	4,246	1,195	572	725
S. of Carmel Interx. Carmel					Lomita on Redondo-Wilmington		9,869	6,318	5,123
Valley and Big Sur Roads	2,915	1,369	615	613	Rd. on 60.....				6,876
San Simeon 1 Mi. S.....	184	113	98	121	Seal Beach at L. A.-Orange Co.				
					Line.....	13,880	6,090	5,603	5,344
Route 57. Santa Maria to Freeman via Bakersfield					Newport W. of Cy.....	7,976	2,656	3,344	2,831
District V					Newport at Interx. Newport-				
Santa Maria N. of Cy. at Jc.					Tustin Road,				
Rt. 2.....	165	65	201	70	W. on 60.....	6,491	1,864	2,653	2,208
At Inx. Rt. 57 and Suey Rd.,					N. on C.R.....	5,558	2,256	2,958	2,912
W. on 57.....	117	33	163	40	S. on C.R.....	4,363	2,215	1,781	2,240
N. on Suey Rd.....	141	53	35	16	E. on 60.....	7,871	2,554	3,376	2,892
E. on 57.....	242	77	171	52	Serra Jc. Rt. 2 on 60.....	4,493	1,636	1,895	1,873
Bet. 2d Cuyama, King and									
Kern Co. Line on 57 B. C.	72	45	13	14					
Route 57. District VI					Route 61. La Canada to Mt. Wilson Road via Arroyo Seco				
S. L. O.-Kern Co. Line.....	122	67	36	43	District VII				
Maricopa W. of Cy.....	323	296	602	526	Pasadena at N. Cy. Lts.....	2,350	514	3,061	605
Pentland at R. R. Xing.....	452	505	1,002	1,294					
Bakersfield Jc. C.R. to Connor,					Route 63. Big Pine to Oasis				
W. on 57.....	201	118	86	87	District IX				
N. on C.R.....	61	46	49	41	Big Pine, Jc. Rt. 23.....	102	131	15	38
E. on 57.....	156	77	66	53					
Jc. Rt. 4.....	168	79	72	69	Route 64. Mecca to Blythe				
Bakersfield E. Nile and School					District VIII				
House Easterly Cy. Lts.....	1,733	2,235	2,168	2,294	Desert Center.....	88	97	94	91
Bakersfield 10 Mi. E. at Jc. Co.					Blythe, S. D. Quarantine Sta.....	255	184	101	66
Club Rd. and Ker-57-E,									
on 57.....	407	171	693	239	Route 65. Auburn to Sonora				
Bodfish at Interx. Rt. 57 with					District III				
C.R. to Caliente,					Auburn at Wire Bridge, American				
E. on 57.....	99	67	25	37	River,				
S. on 57.....	132	84	23	38	N. on 65.....	218	77	40	53
S. on C.R.....	19	26	7	5	E. on C.R.....	95	30	7	9
					S. on 65.....	118	59	34	39
Route 58. District IX					Placerville N. of Cy. Jc. George-				
Mojave.....	144	93	47	92	town Rd.,				
					N. on 65.....	291	216	129	167
Route 58. Mojave to Arizona Line Near Topoe via Barstow					N. on C.R.....	66	59	13	28
District VIII					S. on 65.....	355	276	132	196
Kramer-Kern Co. Line.....	79	76	No count—snow		El Dorado S. of City.....	220	128	50	41
Barstow N. of Cy. at Jc. C.R.									
to Yermo,									
S. on 58.....	318	320	No count—snow						
W. on 58.....	199	175	No count—snow						
N. on C.R.....	138	154	No count—snow						

Route 65. District X		January, 1928		January, 1930	
Station location		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Central House Jc. Rt. 54 to Michigan Bar.					
N. on 65.....	369	332	232	196	
W. on 54.....	366	212	289	291	
S. on 65.....	402	326	275	244	
N. of Jackson Jc. Rt. 34.					
N. on 65.....	605	683	602	774	
E. on 34.....	834	755	784	845	
S. on 34.....	400	186	338	227	
S. of San Andreas at Sheep Camp					
W. of Sonora Jc. Co. Rd. to Jamestown.	1,439	446	1,061	381	
N. W. on 65.....	382	190	102	70	
S. W. on C.R.....	204	108	52	36	
S. W. on 65.....	429	221	108	26	

Route 66. Manteca to Route 5 Near Mossdale School		District X	
Station location		1,919	1,121

Route 67. Pajaro River to Route 2 Near San Benito River Bridge		District V	
Station location		1,763	949
San Juan Bautista N. of City at Jc. Rt. 2.....			
	1,763	949	1,404
			1,051

Route 68. District IV		District IV	
Station location		6,703	4,662
N. City Limits S. San Francisco			
S. San Francisco at Underpass	7,736	3,329	8,933
Burlingame Jc. Rt. 68 and Broadway.			7,557
N. on 68.....	7,248	2,860	7,009
W. on Broadway.....	2,318	1,421	5,658
S. on 68.....	5,725	1,844	2,401
			2,734
			3,669

Route 69. San Quentin Road. District IV		District IV	
Station location		1,825	943
San Quentin Hill.....			
	1,825	943	2,649
			1,135

Route 70. District IV		District IV	
Station location		822	651
Ukiah Jc. Rt. 1.....			
	822	651	529
			651

Route 71. Crescent City to Oregon Line		District I	
Station location		654	579
Crescent City N. of Town at Maint. Yard.....			
At Oregon Line.....	263	136	616
			563
			133

READ THEM AND WEEP

On the air last Monday night Wade H. Ellis of the American Bar Association's crime commission declared that crime costs the United States \$13,000,000,000 a year.

Speaking in Paris on July 11, 1928, Homer Folks said that illness costs the United States \$15,000,000,000 a year.

Insect pests, we were informed by the Agriculture Department on May 7, cost the United States \$2,000,000,000 a year.

Preventable accidents, said the National Safety Council on October 3, 1928, cost the United States \$5,000,000,000 a year.

Bad weather, a crop insurance expert recently estimated, costs the United States \$2,620,000,000 a year.

The smoke nuisance, according to figures issued by the Merchants Association on May 20, 1928, costs the United States \$2,040,000,000 a year.

Rats, declared the Federal Public Health Service on February 2, cost the United States \$364,000,000 a year.

It is terrible enough to know that every year this country loses the price of a couple of wars. If the estimators are given free hand we shall be broke in a few years.—New York Sun.

HOW CALIFORNIA CARES FOR THE BLIND

(Continued from page 8.)

for employees, a women's industrial shop, and a building containing a central power plant, an assembly hall, and a lounge room for inmates were constructed.

Expansion of industrial training opportunities was aided in 1928 by the addition of a second story to the women's industrial shop, providing adequate facilities for basketry, weaving, rug making and other activities of a similar nature.

Since the founding of the Industrial Home, broom making has been the chief industry and has been carried on in wooden buildings, where the dust nuisance and lack of proper heating and ventilation has been a serious drawback. Also, of recent years the broom factory has been badly overcrowded. The need of remedying this situation was recognized by the present administration and an appropriation was made by the 1929 legislature for a new building, bids for which have already been received by the Division of Architecture, and it is expected that construction will proceed rapidly.

The new broom factory will be of concrete construction with tile roof, and is planned as a modern factory building with large areas of glass, adequate heating and ventilation and special exhaust ventilation at points where dust is created so that it may be removed and not permitted to create a nuisance. A mezzanine floor with hydro-electric elevator service furnishes ample space for storage of a large stock of finished brooms.

Another important addition to the permanent buildings is the sales and office building now under construction. This will provide an adequate salesroom with show windows for display of articles manufactured by the blind, which has not been possible heretofore. The building will also contain the administration office and public reception room. A unique and appropriate detail on this building is a frieze of sandblasted redwood depicting in conventionalized form the different manufactures carried on by the blind, with other panels showing "Homer the Blind Poet" and "Louis Braille, Teacher of the Blind."

NEW YORK—The new markers introduced on state highways have black raised letters on a white, octagonal background and small button reflectors within the letters make the signs highly visible at night.

State Highway Progress Reports

ALAMEDA COUNTY

An important section in the state highway system between Hayward and Niles of the Oakland-San Jose road is fast nearing completion. Construction work during the winter period has been somewhat retarded, due to inclement weather, the contractor's forces being busily engaged as conditions would permit.

The Portland cement concrete shoulder and pavement sections have been completed and opened to traffic. All structures have been completed including the widening of the undergrade crossing of the Southern Pacific Railroad at Niles.

All asphaltic concrete work between Niles Underpass and Hayward has been practically completed, there still remaining a small section of asphaltic concrete surfacing from the Niles Underpass south to Alameda Creek bridge through the town of Niles. This latter work will materially improve the situation in Niles, in that the surface will be smooth and of adequate width to handle through traffic through the town. The contractors are now busily engaged in widening the roadbed shoulders and finishing.

ALPINE COUNTY

The surfacing on the State Highway between Markleeville and Woodfords was completed in December, in time to give the residents of Markleeville a much improved highway during the stormy weather. This stretch of road has been very hard to negotiate in past years due to lack of surfacing.

AMADOR COUNTY

The highway between Jackson and Pine Grove has been gravelled in the worst sections, so that for the first time this stretch of road is passable throughout the stormy winter season.

BUTTE COUNTY

Excellent progress is being made by Convict Camp 17, under Superintendent Rawson, in the construction of the 7-mile section of graded highway from the Feather River crossing to a point opposite Bloomer. It is expected that the grading of this section will be completed about the middle of the summer.

Grading and surfacing of the highway from Oroville to the Feather River crossing, Ariss-Knapp Company, contractors, is rapidly nearing completion. It is expected that all work on this job will be done by the middle of March, and this portion of the Feather River Highway will be available for local traffic at that time. Meanwhile, it is expected that the bridge across the Feather River, adjoining this contract, with the convict construction on the opposite side, will be

completed during the summer, and this will make the lower 12 miles of the Feather River Highway available for traffic, as far as Bloomer.

CALAVERAS COUNTY

Bids were opened February 19 for surfacing with crushed rock the road from Murphy to Big Trees, and on February 26 for grading and rock surfacing between 1½ miles north and 1½ miles south of Calaveritas Creek. This is on the Mother Lode Highway between San Andreas and Angels.

In spite of the heavy snow storms during January the road from Angels Camp to Big Trees was kept open to traffic at all times by the maintenance forces, equipped with snow plows.

FRESNO COUNTY

Convict Camp located near Hume in Fresno County, on the Kings River Road, has been able to continue operations even though handicapped by bad weather conditions. Snow fell to a maximum depth of about 4 inches at the highest elevation and temperature dropped to 6 degrees below zero. By continued efforts, the road leading through General Grant Park to Pinehurst was kept clear to sufficient extent that a truck made triweekly trips for mail and supplies. About 8 miles of road has been under construction since July of last year and of this mileage, 5 miles has been practically completed.

KERN COUNTY

On Route 57, between Maricopa and Route 4, two contracts have been awarded. For the portion twelve miles east of Maricopa, George W. Ellis, assignee, is preparing to place an oil-treated surface on the newly graded and rock-based highway. From San Emigdio road to Route 4, the V. R. Dennis Construction Company was successful bidder and is preparing to begin operations of grading, placing of rock base and oil-treated surface. The completion of these contracts will afford practically paved route from main Route 4 to Maricopa and adjacent oil fields.

On Route 33, Valley Paving and Construction Company have started operations on their contract which calls for grading and surfacing with a crushed rock base and 2 inches of bituminous macadam top 15.5 miles, from the west line of Kern County east of Shandon to Junction pumping station.

On Route 33, east of Lost Hills, the Hartman Construction Company is laying crusher run base and bituminous macadam top on a 2-mile line change which will eliminate two right angle turns.

Under day labor authorization, widening of roadway is under way between Democrat Springs and Weldon. This will include the construction of a 60-foot timber bridge over Clear Creek near Hobo Hot Springs.

During the middle of January the heaviest snowfall for a number of years occurred, which resulted in some inconvenience to travel over the Ridge Route. A number of successive snowfalls occurred, reaching a maximum depth of about 2 inches on pavement and maintenance forces concentrated all efforts in an endeavor to keep the road open for travel.

KINGS COUNTY

An improvement contributing greatly to the safety of motor traffic has been recently completed between Lemoore and a point 10 miles westerly on Route 10 between Hanford and Coalinga. This work involves sanding of earth shoulders, thereby eliminating the danger of vehicles which leave the pavement, especially during wet weather. The natural soil conditions in this vicinity are such that they become dangerous when wet and the sand surfacing is equivalent to widening the safe width of roadway which can be used.

LASSEN COUNTY

Work has been completed by Hein Brothers and Chittenden on their contract for resurfacing the highway from Brockman Crossing to Buntingvale, a distance of about 10 miles. This reinforcing of the old gravel surface will make it possible to place an armor coat asphaltic surfacing during the coming summer months, which will effect a considerable improvement for the heavy traffic which uses this highway on the road to Reno.

The work of reinforcing the 7-mile section of the highway from Buntingvale to Milford by state forces was completed in January, which, like the above mentioned section, will make it possible to place a high type of asphaltic surface during the coming summer season.

LOS ANGELES COUNTY

The contract for a line change immediately north of the Newhall tunnel has been awarded to McCray Company. Good progress is being made on this work. It is expected that this contract will be completed next June.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of 40-foot roadbed was awarded to H. W. Rohl Company on August 14th. Rough grading is in progress on one and one-half miles. It is expected that this contract will be completed by next July.

A contract for paving the Newhall Alternate with Portland cement concrete, 30 feet wide, has been awarded to Jahn & Bressi. Grading of this section has just been completed by Le Tourneau & Lindberg. The new location is on greatly improved alignment and eliminates Sangus, Newhall and the Newhall tunnel from the Ridge Route. This section is 8.6 miles long. Paving will probably be completed by next August.

A contract for grading and paving a line change near Liberty School, 4 miles west of Calabases, was awarded to the Will F. Peck Company, January 18, 1930. This line change eliminates several bad curves and improves the grade. It is expected that this contract will be completed next August.

LOS ANGELES AND VENTURA COUNTIES

A contract for oil mix shoulders between Calabases and Conejo Summit has been awarded to the Southwest Paving Company. It is expected that this contract will be finished in April.

MADERA COUNTY

Paving work on both contracts between Berenda and North County Line on Route 4 in Madera County have been completed by the Valley Paving and Construction Company for the south 4½ miles and A. Treichert and Son, Inc., for the mileage from Califa to North Boundary. The last mentioned contract is 20-foot asphaltic concrete and the southerly work consisted of 20-foot Portland cement concrete. Separating the two projects is the Califa Subway under contract to Otto Parlier. This work is also practically complete with the exception of placing supporting steel and track changes being done by the Southern Pacific. As soon as this is completed and the shoo-fly track removed, the subway will be opened to traffic.

MARIN COUNTY

Contractors Granfield, Farrar & Carlin have practically completed the grading of the 4.4 miles section of new highway from San Rafael to Alto. This route is an important link in the proposed reconstruction work between San Rafael and Sausalito, which ultimately will reduce the distance between these cities approximately 4 miles. The work is not as yet in a completed stage, due to the fact that before traffic can make use of it three major structures which are now under construction must be complete before through traffic can be put over the road. These structures are:

- (1) Overhead structure of the Northwestern Pacific Railroad Company at California Park near San Rafael.
- (2) A moveable span structure across Corte Madera Creek at Greenbrae.
- (3) An overhead crossing of the Northwestern Pacific Railroad at Detour about one-half mile south of Greenbrae.

All three structures are well under way and there yet remains the work of advertising a contract for surfacing the graded roadway which will be undertaken at an early date. The surfacing of this road and the completion of the bridges should be brought about by July 1, 1930, in ample time to open this important link in the Redwood Highway to the heavy summer traffic.

Marin and Sonoma counties, in fact all the population north of the bay are vitally interested in the activities of the Highway Commission in this area, in view of which they anticipate many pleasant trips to the San Francisco Bay over the reconstructed highways, which will reduce by many miles the distance between Santa Rosa and San Francisco and likewise reduce the running time considerably. These, together with the fact that the new road will obviate the many hazards on the existing Corte Madera grade has left a very favorable impression with the populace of the northern counties.

These same contractors have under construction, also, 1.8 miles of reconstruction from San Rafael to Gallinas Creek, immediately north of the city. The major work under their contract consists of very

heavy grading, nearly all of which has been completed in ample time to permit of settlement during the heavy winter rains. We anticipate that by spring the entire roadway will be sufficiently settled to permit of the placing of Portland cement concrete and bituminous macadam pavements, all of which will be completed by early summer. This road, however, will not be available for use of traffic until an overhead structure is completed across the Northwestern Pacific Railroad at Forbes Station. This structure is now advertised for bids and upon receipt of same, a contract will be awarded at an early date.

Traffic during the interim is being handled along the present state highway between the terminals which is somewhat circuitous although serves as an adequate detour. The completion of this contract will offer to the traveling public a widened and reconstructed highway on high standards from San Rafael to Ignacio, the junction of the two state highways leading from Santa Rosa and the Napa Valley.

MARIN AND SONOMA COUNTIES

The Hanrahan Company of San Francisco have a large contract under way from a point one mile south of Petaluma to Ignacio. Work has been under way during a greater part of the winter period although this contract lies over a considerable marshy area adjacent to San Pablo Bay. It has not been practical to pursue construction to the full extent permissible; however, there are a number of minor line changes where the reconstructed work is on new right of way and at these locations the contractor has made continuous progress during the winter months, the work here, involving heavy grading, having kept the contractor's forces busy.

Concrete and pipe structures have been installed, leaving the entire contractor's organization available for the placing of hard pavement surface. The placing of Portland cement concrete second story pavement has commenced and a small portion has been placed from about one mile north of the Sonoma County line to the northerly terminus of the contract near Petaluma. Weather conditions permitting, we are expecting the contractor to expedite the completion of Portland cement concrete pavement and the construction of a small amount of bituminous macadam pavement on line changes in order to have this important link available for traffic as soon as possible.

A new concrete bridge is now being completed across San Antonio Creek on the county line between Marin and Sonoma counties. A new concrete bridge was recently completed and accepted across the channel of Novato Creek, south of the town of Novato. These two structures complete all major drainage work in the contract. The total length of work involved is 11.8 miles.

MARIPOSA COUNTY

During the period from January 6 to 14, a total of 63 inches of snow fell at intervals on State Highway Route 18. The maintenance crew, by persistent work, were able to keep the route open to travel and very little delay and inconvenience was caused to traffic. Heavy week-end traffic to Yosemite of motorists who desired to see snow conditions and participate in winter sports, suffered but slight inconvenience due to the snowfall and the fact that the maintenance

crews worked continuously following each snowfall to keep the road open.

Favorable comment on the work done by maintenance crews in keeping this road open to traffic was received from Col. Thompson, Superintendent of Yosemite National Park, and from various other interested parties.

MENDOCINO COUNTY

Contractor W. C. Colley has completed all work on the McDonald-to-the-Sea highway. The contract required the construction of three timber bridges across Flynn Creek, North Fork of the Navarro River and at Indian Creek, together with approaches and the grading of a line change to obviate two existing structures, the total length of work being 1.8 miles.

The completion of this improvement has removed some of the more hazardous sections on this important road and this section of Mendocino County is realizing the benefit of a new highway constructed to high standards. The Highway Department also contemplates awarding a contract to do considerable further work in eliminating dangerous stream crossings and straightening out heavy grades at a number of important places. It is hoped that this work will be under way by early summer and be completed before the fall rains.

MERCED COUNTY

Under day labor, three bridges, spanning irrigation canals in Merced County on Route 4, have been widened, thereby removing potential hazards to traffic. Various accidents have occurred in the past due to the rather restricted road width. The widening should be a very material factor in avoiding future accidents. West of Los Banos, where soil conditions are particularly bad in wet weather, gravel shoulders have been placed, thereby increasing the safe width of traveled way.

MODOC COUNTY

The connection with the highway from the main street of Alturas eastward to the Cedarville highway was under construction during the past month, and will be completed in the spring, thereby eliminating two bad right-angle turns for eastern traffic.

NAPA COUNTY

The contract of Fredrickson & Watson Construction Company and Fredrickson Bros. has been accepted. This contract covered the reconstruction of a portion of the existing state highway from Greenwood Corners to the Napa County line, the old 15-foot concrete pavement being widened with macadam shoulders and the entire reconstructed width of 20 feet being surfaced with bituminous macadam. The completion of this road is of material assistance in handling the heavy traffic between the Sacramento Valley and the bay district, in that it is the last link in this section to be widened to a standard width of 20 feet.

ORANGE COUNTY

A contract for paving one-half width between Santa Ana and Anaheim was awarded on June 11th to Griffith Company. This section is 4.9 miles long. The paving work was done in cooperation with Orange County, the state paying for a strip of pavement 28 feet by 7 inches and the county paying for a like amount. All work is now completed on this project.

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90- to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Macco Construction Company. When this work is completed the pavement will be 30 feet wide for the entire distance. It is expected that this work will be completed by next December.

A small contract for replacing temporary surfacing with Portland cement concrete, 30 feet wide, between Dana Point and Serra has just been completed. Matich Bros. were the contractors on this work.

PLUMAS COUNTY

Work is just starting on the grading and surfacing of the 3-mile gap in the highway southwest of Chester, and it is expected that this section, including the main street through the town of Chester, will be completed before the peak of the summer traffic sets in. The completion of this gap, together with the 4-mile section which is now under construction in Lassen County, just east of Westwood, will complete an improved highway from a point 12 miles east of Red Bluff to Susanville.

Excellent progress is being made by the convict camp under Superintendent Stout, at Paxton. Almost 7 miles of the 10-mile section which is being constructed by this camp have been practically completed, extending from the county road 2 miles west of Keddie to a point about opposite Twain. The completion of this section will furnish the people of Virginia, Twain and Paxton with direct communication with the outside world.

SACRAMENTO COUNTY

The grading and surfacing contract between Arno and McConnell on the main highway between Sacramento and Stockton was completed some time ago. Traffic, however, was kept on the detour until February 10, due to the bridge contract not being completed.

SAN DIEGO COUNTY

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 16-foot graded roadbed. It is expected that this contract will be completed next summer.

The contract for grading a roadbed 36 feet wide and placing of Portland cement concrete pavement 20 feet by 7 inches has just been completed between Pine Valley and Kitchen Creek on the San Diego-El Centro Highway. Basich Brothers were the contractors.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. It is expected that this contract will be completed next June.

A contract for grading 3.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20-foot by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. About 3 miles of rough grading is completed, and grading is now in progress on about one mile. It is expected that paving will start shortly. This section is on the San Diego-El Centro Highway.

SAN JOAQUIN COUNTY

Contractor C. W. Wood completed his job of grading and cement concrete paving between Banta and the San Joaquin River on February 14. This eliminates the most hazardous section of this important road.

On March 12 bids will be opened for paving with cement concrete the road from Cherokee Station to Harney Lane. This stretch of nearly eight miles is known as Cherokee Lane and is the main Valley road between Stockton and Sacramento. Nearly 100 separate owners were dealt with in securing the rights of way, and considering the type of property and improvements, I feel that our Right of Way Department, headed by A. M. Nash, has made a fine showing on speed and economy.

SAN MATEO COUNTY

A new unit in the important Bayshore Highway is now under way, a contract having recently been awarded to Fredrickson & Watson Construction Company and Fredrickson Bros. covering that portion from Fifth street, San Mateo, to Redwood City, a length of approximately 7.3 miles. A major length of this section lies across the salt marshes along the westerly side of San Francisco Bay. In addition to the installation of drainage structures, this contract is somewhat unique in that a major portion of the northerly part is to be constructed of hard material obtained from the borrow pit in Belmont Terrace. This borrow pit, being centrally located, will furnish some 450,000 yards of excavation for the roadbed section. A high elevation is being maintained to provide a roadway above the high tides of the intervening sloughs.

From Belmont Terrace, south toward Redwood City, a greater portion of the work consists of dredger fill embankment. This portion offers adequate facilities for this type of construction and in view of the desire of the adjacent owners in reclaiming portions of their lands through suction dredge methods, work will be combined in filling the highway area and a portion of the adjacent property.

Great interest in the Peninsula is being centered in this contract of the Bayshore Highway, in that the completion will provide an additional highway, as at the present time but one through highway exists between San Mateo and Redwood City. The congestion on this one link has been serious on Sundays and holidays, evidenced by the bunching up of traffic during peak hours immediately south of the city of San Mateo. A recent traffic count at this point revealed an excess of 29,000 cars during a 16-hour period. Once this condition is relieved by the opening of the new unit of the Bayshore Highway, traffic will have

two completed state highways between San Francisco and Santa Clara points along the bay, not including the Skyline boulevard which lies along the crest of the hills some distance to the west.

SANTA CLARA COUNTY

Contractor N. M. Ball has completed all paving in the reconstruction of a portion of the Peninsula Highway from Santa Clara to Sunnyvale. The contract was recently completed and accepted by the Director of Public Works. The work consisted chiefly of widening and resurfacing the existing pavement by constructing a 10-foot Portland cement concrete shoulder on the westerly side of the old pavement and placing a 4-inch minimum thickness of asphaltic concrete on the old pavement, providing a 30-foot width of pavement throughout the length of the contract.

A line change of considerable importance was constructed from Sunnyvale to Butchers Corner in a direct line. This change eliminates two dangerous curves in the old road which are now entirely eliminated from the reconstruction work.

A contract has recently been awarded to the Hanrahan Company of San Francisco for reconstructing that portion of the Peninsula Highway from San Francisco Creek Bridge in Palo Alto to San Antonio avenue (Los Altos Junction). This reconstruction work lies in a very heavily populated portion of Santa Clara County. There are some line changes of considerable importance which have required the moving of buildings.

The construction work consists chiefly of widening the concrete bridge across San Francisco Creek on the county line between San Mateo and Santa Clara counties, and the placing of a Portland cement concrete shoulder and resurfacing the old pavement with asphaltic concrete. The reconstructed roadway from San Francisco Creek to the south limits of Mayfield is to be 40 feet wide. From the south line of Mayfield to Los Altos Junction the pavement will be 30 feet wide. On line changes involving new construction the pavement will consist of 30-foot width Portland cement concrete. A small exception in the contract will eliminate the business district in Mayfield.

SHASTA COUNTY

Work started on the construction of six timber bridges on Route 28, between Montgomery Creek and Burney, in January, and construction of the approaches to these bridges will be under way during the coming month. The completion of these bridges will eliminate several old structures which have been an inconvenience, if not an actual menace to traffic for some years.

During the recent heavy snow storms in the northern section of the state, particularly heavy snow removal was necessary between Redding and Burney, on the Alturas lateral, and on the Pacific Highway through the Sacramento Canyon. Snow to a depth of 5 feet on the former route and 4 feet on the latter was handled effectively by the maintenance forces under superintendents Macanlay and Tremper, and the roads were kept open at all times.

SISKIYOU COUNTY

The concrete paved highway from the Shasta River

to Gazelle, at the southerly end of the Shasta Valley, for a distance of 8 miles, was completed early in February, and the improvement effects a great convenience to traffic, particularly through the winter months. An excellent job of paving was secured by the T. M. Morgan Company, under the supervision of resident engineer Baker, in spite of the very trying conditions of freezing and wet weather which existed during the latter portion of the work.

Work started early in February on the heavy piece of construction between Yreka and the Klamath River. Wren and Greenough, contractors. It is expected that the exceptionally heavy grading on this contract will be well under way in the next month or so, since the contractor plans to install seven or eight power shovels on the work. Work to date has consisted of the construction of a detour on the opposite side of the river, for a distance of over a mile on the lower portion of the canyon, on which to carry traffic during the construction of the highway on the heavy slopes on the opposite side of the river. Three of five bridges which are physically part of this project, although under different contracts, have either been completed, are under construction, or are advertised for contract.

Many minor improvements which have been made to the road on the lower Klamath River during the past season or two have effected a great convenience for the traffic using that road, and winter traffic particularly has been greatly benefited. Numerous stretches which have been graveled have kept the traffic out of the mud, and the many places which have been widened and drained have made it possible to carry traffic this winter with greater ease than in any preceding winter, in spite of the fact that unusual snow conditions made the season particularly difficult.

SOLANO COUNTY

On February 1, the contract for grading and paving with cement concrete the line change through Dixon was awarded to C. W. Wood. This will eliminate two grade crossings with the main line of the S. P. R. R. where some fatal accidents have occurred in the past.

In order to make the asphaltic concrete pavement safer for traffic during wet weather maintenance forces have kept the pavement sanded during wet weather which has materially lessened the accidents on this slippery pavement. Two honing machines are busily engaged planing the slippery pavement to remove excess asphalt and provide a nonskid surface, which will be much safer for traffic.

TEHAMA COUNTY

With the construction of the bridge across Cottonwood Creek, at the Tehama-Shasta County line, which is nearing completion, and with the construction of the subway and connections north and south from this bridge, which it is expected will be let to contract during the next couple of months, one of the worst situations on the Pacific Highway will have been eliminated.

Through the efforts of superintendents Gribble and Stump, the Red Bluff-Susanville Highway was kept open during the heavy and protracted snow storm in the month of January. This opening was made possible by the completion of the improved highway from Morgan Springs to Chester last fall. An exceptionally severe test of equipment and men engaged upon this

work was made by the heavy snowfall, and neither were found wanting.

Work is well under way on the resurfacing of portions of the 30-mile section of the highway from Paynes Creek to Morgan Springs. A. F. Giddings, contractor, these portions constituting about two-thirds of the entire length. This resurfacing will strengthen the existing base sufficiently to permit of a higher type of oiled treatment later.

TRINITY COUNTY

Excellent progress is being made by Conviet Camp 12, on the grading of the highway over the Buckhorn Summit, between Redding and Weaverville. All of the grading has been completed along Grass Valley Creek, to a point within 1.5 miles of the county line, and work is now being concentrated on the easterly side of the divide, with the object of completing the connection on that side, which will open the 5-mile section of highway to the foot of the mountain for traffic, possibly by August.

Considerable improvement has been effected in the narrow road between Burnt Ranch and Salyer during the past two months, by the widening of several narrow places on the precipitous bluffs along that section.

TULARE COUNTY

Valley Paving and Construction Company has resumed paving operations between Earlimart and Delano, after ceasing work during the greater part of January due to bad weather conditions.

A contract has been awarded to California Construction Company for widening and resurfacing 45-foot pavement between Pixley and Tipton Railroad Crossing, a distance of 8.6 miles. Contractor is now moving in equipment and preparing to start operations.

TUOLUMNE COUNTY

The surfacing job under contract to the Adams Co., between near Shaw's Flat and the Sonora-Columbia road has been delayed by winter storms. It is progressing fairly well now that the weather has improved.

VENTURA COUNTY

A contract for second story paving with asphaltic concrete from Conejo Creek to Camarillo has just been completed by Griffith Company.

Sandy (to his daughter): Young McPherson has asked me for your hand, and I have consented.

Daughter: You dear old dad!

Sandy: So never mind going to the dentist's now to have that tooth pulled—wait until you are married.—*Passing Show.*

MISSOURI—A new \$1,000,000 highway, 20 feet wide, extending west from St. Louis through St. Louis County is being constructed on a right of way of 100 feet.

Record of Bids and Awards

HIGHWAY BIDS AND AWARDS

For Month of February

CALAVERAS COUNTY—Between Murphy's and Big Trees, 15.5 miles to be surfaced with untreated crushed gravel or stone. Dist. X, Rt. 24, Sec. E. M. J. Bevanda, Stockton, \$76,616; Hemstreet & Bell, Marysville, \$69,040; Chas. Harlowe, Jr., Oakland, \$67,964; W. H. Hauser, Oakland, \$72,080. Contract awarded to Beerman & White, Stockton, \$67,956.

KERN COUNTY—Between Cinco and 7 miles north of Ricardo, 15 miles to be graded and surfaced with oil-treated crushed gravel or stone. Dist. IX, Rt. 23, Secs. C and D. Kennedy-Bayles Const. Co., Oakland, \$287,366; J. P. Holland, Inc., San Francisco, \$272,074; Hemstreet & Bell, Marysville, \$277,005; G. W. Ellis, Los Angeles, \$263,815; Hall-Johnson Company, Alhambra, \$333,385; Hartman Const. Co., Bakersfield, \$322,612; Isbell Construction Co., Fresno, \$297,488; Mutual Income Properties, Inc., Los Angeles, \$249,805; Arris-Knapp Co., Oakland, \$331,970. Contract awarded to George Herz & Co., San Bernardino, \$242,768.80.

LOS ANGELES COUNTY—Alternate to Ridge Route, between Castaic School and Canton Creek, 7.1 miles to be graded. Dist. VII, Rt. 4, Sec. G. Sander Pearson, Santa Monica, \$674,660; Kern & Kilbe, San Francisco, \$830,310; J. G. Donovan & Son, Los Angeles, \$653,792; T. M. Morgan Paving Co., Los Angeles, \$622,503; Isbell Construction, Fresno, \$794,156; McCray Co. & Martter & Beck, Los Angeles, \$717,044; J. F. Shea Co., San Francisco, \$710,063; Guy F. Atkinson Co., San Francisco, \$648,374; Gist & Bell, Arcadia, \$684,457; Hamman Co., San Francisco, \$722,677; The Utah Construction Co., San Francisco, \$638,771; H. W. Rohl Co., Los Angeles, \$540,264; Fisher, Ross, MacDonald and Kahn, Inc., Azusa, \$811,212; Geo. Pollock, Sacramento, \$599,529; R. G. Le Tourneau, Stockton, \$577,725. Contract awarded to H. E. Doering & Von Der Hellen & Pierson, Berkeley, \$537,629.50.

LOS ANGELES AND VENTURA COUNTIES—Between one mile east of Los Angeles-Ventura County line and the top of Conejo Grade, super-elevating curves. Dist. VII, Rt. 2, Secs. C, A and B. Contract awarded to Griffith Company of Los Angeles, \$2,800,225.

SISKIYOU COUNTY—Reinforced concrete bridge about 5.5 miles north of Yreka, consisting of one 200-foot open spandrel arch span and three 40-foot girder approach spans. Dist. II, Rt. 3, Sec. C. M. B. McGowan, San Francisco, \$74,988; Lord & Bishop, Oroville, \$81,688; Guy F. Atkinson Co., San Francisco, \$81,894; Skeels & Graham, Roseville, \$76,857; Ward Engineering Co., San Francisco, \$81,386; Fred J. Maurer & Son, Inc., Eureka, \$74,985; H. E. Doering, Portland, Oregon, \$71,990. Contract awarded to Jacobs & Pattiani, Oakland, \$71,548.

"Say," said the prospect, who was being given a demonstration in a used car, "what makes it jerk so when you first put it in gear?"

"Ah," the suave salesman explained, "that proves it to be a real car—it's anxious to start."—*American Legion Monthly.*

AWARD OF CONTRACTS DIVISION OF ARCHITECTURE

For the Month of February

SONOMA STATE HOME, for constructing assistant physician's residence. Contract awarded to G. Magnuson & Company of San Bruno; price, \$7,300.

NAPA STATE HOSPITAL, for constructing assistant physician's residence. Contract awarded to G. Magnuson & Company of San Bruno; price, \$7,345.

SAN FRANCISCO STATE BUILDING, for general work on additional wings. Contract awarded to Vogt & Davidson, Inc., San Francisco; price, \$206,643. Contract for electrical work on above; contract awarded to Porter Electric Company of San Francisco; price \$10,600. Contract for heating and plumbing work on above; contract awarded to Scott Company of San Francisco; price, \$16,184.

WATER APPLICATIONS AND PERMITS

Applications for Permit to Appropriate Water Filed with the State Department of Public Works, Division of Water Resources, during February, 1930.

MOXO COUNTY—Application 6547. Gladys Koebig, 2404 8th avenue, Los Angeles, for 200 gallons per day from small unnamed stream tributary to Mammoth Creek and Owens River to be diverted in Sec. 17, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$90.

LOS ANGELES COUNTY—Application 6548. Isaac Wiskerson, Palmdale, for 0.025 c.f.s. from Granite Springs tributary to Wiskerson Canyon of Amorgosa Creek drainage to be diverted in Sec. 24, T. 6 N., R. 14 W., S. B. M., for domestic and irrigation purposes. Estimated cost \$400.

EL DORADO COUNTY—Application 6549. L. T. Butts, Placerville, for 0.25 c.f.s. from Emigrant Ravine Creek tributary to Hangtown Creek to be diverted in Sec. 5, T. 10 N., R. 11 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$500.

PLUMAS COUNTY—Application 6550. Quincy Lumber Company, Inc., Quincy, for 50,000 gallons per day from February 15th to December 15th of each season from Buckhawk Creek tributary to Spanish Creek, Indian Creek, North Fork Feather River to be diverted in Sec. 33, T. 25 N., R. 9 E., M. D. M., for industrial purposes. Estimated cost \$500.

PLUMAS COUNTY—Application 6551. Quincy Lumber Company, Inc., Quincy, for 1.56 c.f.s. from Middle Fork of the Feather River tributary to Feather River to be diverted in Sec. 15, T. 23 N., R. 11 E., M. D. M., for industrial purposes. Estimated cost \$1,500.

PLUMAS COUNTY—Application 6552. Quincy Lumber Company, Inc., Quincy, for 50,000 gallons per day from West Branch Peoria Creek tributary to Middle Fork of Feather River to be diverted in Sec. 19, T. 23 N., R. 11 E., M. D. M., for industrial purposes. Estimated cost \$250.

PLUMAS COUNTY—Application 6553. Quincy Lumber Company, Inc., Quincy, for 50,000 gallons per day from unnamed spring tributary to Bear Canyon, Indian Creek, North Fork Feather River to be diverted in Sec. 20, T. 25 N., R. 9 E., M. D. M., for industrial and domestic purposes. Estimated cost \$250.

PLUMAS COUNTY—Application 6554. Quincy Lumber Company, Inc., Quincy, for 50,000 gallons per day from unnamed spring tributary to Bear Canyon, Indian Creek, North Fork Feather River to be diverted in Sec. 20, T. 25 N., R. 9 E., M. D. M., for industrial and domestic purposes. Estimated cost \$250.

MONTEREY COUNTY—Application 6555. Sidney W. Fish, c/o Agnew & Boeckel, Federal Reserve Bank Bldg., San Francisco, for 0.5 c.f.s. from Palo Corona and tributaries tributary to San Jose Creek to be diverted in Sec. 5, T. 17 S., R. 1 E., M. D. M., for irrigation and domestic purposes.

EL DORADO COUNTY—Application 6556. Arthur E. Rasor, c/o A. J. Harder, 518 Ochsnor Bldg., Sacramento, for 60 acre feet per annum from Rock Creek tributary to South Fork American River to be diverted in Sec. 34, T. 13 N., R. 11 E., M. D. M., for mining purposes.

EL DORADO COUNTY—Application 6557. Arthur E. Rasor, c/o A. J. Harder, 518 Ochsnor Bldg., Sacramento, for 60 acre feet per annum from Rock Creek tributary to South Fork American River to be diverted in Sec. 34, T. 13 N., R. 11 E., M. D. M., for irrigation purposes on 10 acres.

EL DORADO COUNTY—Application 6558. Arthur E. Rasor, c/o A. J. Harder, 518 Ochsnor Bldg., Sacramento, for 60 acre feet per annum from Rock Creek tributary to South Fork American River to be diverted in Sec. 34, T. 13 N., R. 11 E., M. D. M., for recreational and domestic purposes.

NEVADA COUNTY—Application 6559. F. C. Foote, Grass Valley, for 3 c.f.s. from China Flat Ravine tributary to South Yuba to be diverted in Sec. 18, T. 17 N., R. 9 E., M. D. M., for mining purposes. Estimated cost \$1,850.

HUMBOLDT AND TRINITY COUNTIES—Application 6560. Trinity Loop Mining Company, c/o Charles D. Wehr, Atty., Court House, Oakland, for 150 c.f.s. from (1) Horse Range Creek, 30 c.f.s.; (2) Unnamed Creek tributary to Horse Range Creek, 10 c.f.s.; (3) Grove Prairie Creek, 20 c.f.s.; (4) Cedar Creek, 40 c.f.s.; (5) Unnamed Creek No. 3 tributary to Cedar Creek, 2 c.f.s.; (7) Unnamed Creek No. 5 tributary to Cedar Creek, 5 c.f.s.; (8) Unnamed Creek No. 6 tributary to Cedar Creek, 6 c.f.s.; (9) Hawkins Creek, 35 c.f.s. tributary to Trinity River to be diverted in Secs. 8, 17, 18, 19, T. 7 N., R. 7 E., M. D. M., Secs. 26, 35, T. 7 N., R. 6 E., M. D. M., and Secs. 9, T. 6 N., R. 6 E., M. D. M., for mining purposes.

NEVADA COUNTY—Application 6561. Metal products Holding Corporation, 1329 Russ Bldg., San Francisco, for 3 c.f.s. from Phoenix Lake at Old Man Mountain tributary to South Yuba to be diverted in Sec. 4, T. 17 N., R. 13 E., M. D. M., for mining purposes.

GLENN COUNTY—Application 6562. Wm. F. Linton, Orland, for 0.081 c.f.s. from unnamed stream tributary to Walker Creek to be diverted in Sec. 8, T. 21 N., R. 3 W., M. D. M., for irrigation and domestic purposes on 540 acres. Estimated cost \$400.

NEVADA COUNTY—Application 6563. U. S. Dept. of Agriculture, Tahoe National Forest, Nevada City, for 3.14 miner's inches from unnamed springs tributary to North Fork Yuba River to be diverted in Sec. 1, T. 20 N., R. 12 E., M. D. M., for domestic and recreational purposes. Estimated cost \$100.

TRINITY COUNTY—Application 6564. A. J. Norcott and W. H. Badley, Burnt Ranch, Trinity County, for 150 acre feet from November 1st to May 1st of each season from unnamed spring tributary to Trinity River to be diverted in Sec. 34, T. 6 N., R. 6 E., H. B. & M., for mining purposes. Estimated cost \$500.

LOS ANGELES COUNTY—Application 6565. L. A. Sharp, Palmdale, for 0.025 c.f.s. from January 1st to December 31st of each season, from Deer Spring tributary to Armagosa Creek to be diverted in Sec. 14, T. 6 N., R. 14 W., S. B. E. & M., for domestic and irrigation purposes. Estimated cost \$425.

SAN BERNARDINO COUNTY—Application 6566. Christian Baumann, Phelan, for 0.035 c.f.s. from April 1st to November 1st from 4 unnamed springs tributary to no stream to be diverted in Sec. 31, T. 4 N., R. 7 W., S. B. E. & M., for domestic and recreational purposes. Estimated cost \$250.

DEL NORTE COUNTY—Application 6567. Frank Symms, Crescent City, for 0.01 c.f.s. from unnamed spring tributary to Smith River to be diverted in Sec. 30, T. 17 N., R. 2 E., H. B. & M., for domestic purposes. Estimated cost \$200.

LAKE COUNTY—Application 6568. Martin Judge and Company, Crocker First Nat'l Bank Bldg., San Francisco, for 250 c.f.s. and 175,000 acre feet per annum from North Fork Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

LAKE COUNTY—Application 6569. Martin Judge, Jr., Crocker First Nat'l Bank Bldg., San Francisco, for 175,000 acre feet per annum from North Fork of Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation purposes. Estimated cost \$1,000,000.

MONTEREY COUNTY—Application 6570. Warren Gorrell, c/o Agnew & Boeckel, Attys., 604 Federal Reserve Bank Bldg., San Francisco, for 7 c.f.s. and 80 acre-feet per annum from (1) West Fork of Lime

Kiln Creek, (2) South Fork Big Creek and (3) North Fork of Big Creek to be diverted in (1) Sec. 3, T. 22 S., R. 4 E., M. D. M., (2) Sec. 29, T. 21 S., R. 4 E., M. D. M., (3) Sec. 12, T. 21 S., R. 4 E., M. D. M., for irrigation purposes. Estimated cost \$500,000.

SAN BERNARDINO COUNTY—Application 6571. Fred James Machoves, Victorville, for 1.00 c.f.s. from unnamed spring tributary to Grape Vine Canyon to be diverted in Sec. 35, T. 4 N., R. 2 W., S. B. & M., for domestic and irrigation purposes on 80 acres. Estimated cost \$2,500.

SAN BERNARDINO COUNTY—Application 6572. H. O. Webber, et al., Box 4, Lamanda Park Station, Pasadena, for 0.375 c.f.s. from waste and seepage water from irrigated lands tributary to Santa Ana River to be diverted in Sec. 5, T. 2 S., R. 4 W., S. B. & M., for irrigation purposes.

SAN BERNARDINO COUNTY—Application 6573. Mayville Ranch, Highgrove, for 0.37 c.f.s. from waste and seepage water from irrigated land tributary to Santa Ana River to be diverted in Sec. 6, T. 2 S., R. 4 W., S. B. & M., for irrigation purposes on 30 acres.

STANISLAUS COUNTY—Application 6574. J. M. deSouza, Rt. 3, Box 944, Modesto, for 10 c.f.s. from Toulumne River tributary to San Joaquin River to be diverted in Sec. 12, T. 4 S., R. 7 E., M. D. M., for irrigation purposes. Estimated cost \$1,500.

SAN DIEGO COUNTY—Application 6575. George W. Clemson, c/o Scarborough & Bowen, Suite 1225 Washington Bldg., Los Angeles, for 1239 acre-feet per annum from San Marcos Creek tributary to Pacific Ocean to be diverted in Sec. 20, T. 12 S., R. 3 W., S. B. & M., for irrigation and domestic purposes on 890 acres. Estimated cost \$10,000 (not including cost of dam).

AMADOR COUNTY—Application 6576. E. T. Earnest, c/o Olin & Raab, 517 E. Market St., Stockton, for 1.25 c.f.s. from Mokelumne River tributary to San Joaquin to be diverted in Sec. 4, T. 4 N., R. 9 E., M. D. M., for irrigation purposes, 100 acres. Estimated cost \$4,000.

SUTTER COUNTY—Application 6577. M. J. Newkom and H. E. Newkom, Yuba City, for 3 c.f.s. from Feather River tributary to Sacramento River to be diverted in Sec. 35, T. 15 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$16,570.

Permits to Appropriate Water Issued by the Department of Public Works, Division of Water Resources, during the month of February, 1930.

SUTTER COUNTY—Permit 3437, Application 6450. Issued to Mrs. Annie Kirkup, Knights Landing, February 15, 1930, for 9.18 c.f.s. from Sacramento River in Sec. 23, T. 13 N., R. 1 E., M. D. M., for irrigation on 34,427 acres. Estimated cost \$5,000.

SUTTER COUNTY—Permit 3438, Application 6451. Issued to James R. Young, Crandmore, February 15, 1930, for 1.94 c.f.s. from Sacramento River, in Sec. 14, T. 13 N., R. 1 E., M. D. M., for irrigation on 154.96 acres. Estimated cost \$5,000.

VENTURA COUNTY—Permit 3439, Application 6399. Issued to Senior Canyon Mutual Water Company, Inc., Ojai, February 24, 1930, for 1 c.f.s. from Senior Canyon, San Antonio Creek, Ventura River, in Sec. 21, T. 5 N., R. 22 W., S. B. & M., for use for irrigation and domestic purposes on 150 acres. Estimated cost \$65,000.

SUTTER COUNTY—Permit 3440, Application 6418. Issued to Rowena B. Coulter, Grimes, February 24, 1930, for 12.5 c.f.s. from Sacramento River, in Sec. 13, T. 11 N., R. 2 E., M. D. M., for irrigation purposes on 65.63 acres. Estimated cost \$8,000.

DEL NORTE COUNTY—Permit 3441, Application 6441. Issued to Department of Public Works, Division of Highways, Sacramento, February 24, 1930, for 0.017 c.f.s. from unnamed spring in Sec. 29, T. 17 N., R. 2 E., H. M., for domestic purposes. Estimated cost \$850.

DAM APPLICATIONS

APPROVALS

AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of February, 1930.

SONOMA COUNTY—Lake Ralphine Reservoir Dam No. 422. Santa Rosa Water Works, Santa Rosa,

owner; earthen, 30 feet above streambed with a storage capacity of 830 acre-feet. Situated on no stream tributary to Santa Rosa and Los Alamos Creek in T. 7 N., R. 7 W., M. D. B. and M., for storage purposes for domestic and industrial use. Estimated cost \$25,000.

LOS ANGELES COUNTY—San Pedro Dam No. 6-20. City of Los Angeles, Los Angeles, owner; earthen, 21.2 feet above streambed with a storage capacity of 26 acre-feet. Situated in T. 5 S., R. 14 W., S. B. M., for storage purposes for municipal use. Estimated cost not given.

LOS ANGELES COUNTY—Silver Lake Dam No. 6-23. City of Los Angeles, Los Angeles, owner; earthen, 12 feet above streambed with a storage capacity of 2162 acre-feet. Situated in Sec. 8, T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use. Estimated cost \$142,364.

CONTRA COSTA COUNTY—Port Costa Dam No. 581-2. California Water Service Company, San Francisco, owner; earthen, 38 feet above streambed with a storage capacity of 39 acre-feet. Situated on an unnamed creek in Sec. 3, T. 2 N., R. 3 W., M. D. M., for storage purposes for domestic and industrial use. Estimated cost \$13,700.

SONOMA COUNTY—Lawler Reservoir Dam No. 581-3. California Water Service Company, San Francisco, owner; earthen, 22 feet above streambed with a storage capacity of 190 acre-feet. Situated on North Creek tributary to Adobe Creek in Sec. 12, T. 5 N., R. 7 W., M. D. M., for storage purposes for domestic and municipal use. Estimated cost \$46,000.

SONOMA COUNTY—Oak Hill Reservoir Dam No. 581-4. California Water Service Company, San Francisco, owner; earthen, 12 feet above streambed with a storage capacity of 6.62 acre-feet. Situated in Sec. 32, T. 5 N., R. 7 W., M. D. M., for storage purposes for domestic use. Estimated cost \$22,400.

SHASTA COUNTY—Redding Reservoir Dam No. 581-5. California Water Service Company, San Francisco, owner; earthen, 24 feet above streambed with a storage capacity of 10.13 acre-feet. Situated on an unnamed ravine in Sec. 34, T. 32 N., R. 5 W., M. D. M., for storage purposes for domestic use. Estimated cost \$8,500.

EL DORADO COUNTY—Pino Grande Dam No. 467. Michigan-California Lumber Company, Camino, owner; timber, 18 feet above streambed with a storage capacity of 14 acre-feet. Situated on Shoshone Creek tributary to South Fork of American River in Sec. 22, T. 12 N., R. 12 E., M. D. M., for storage purposes for logging use. Estimated cost \$14,000.

VENTURA COUNTY—Dennison Dam No. 761. Dennison Ranch Company, Ojai, owner; buttress, 29 feet above streambed with a storage capacity of 60 acre-feet. Situated on Lions Canyon Creek tributary to San Antonio Creek in Sec. 8, T. 4 N., R. 22 W., S. B. & M., for storage purposes for irrigation. Estimated cost \$8,000.

SAN BERNARDINO COUNTY—Bear Valley Dam No. 803. Bear Valley Mutual Water Company, Redlands, owner; multiple arch, 65.83 feet above streambed with a storage capacity of 72,400 acre-feet. Situated on Bear Creek tributary to Santa Ana River in Sec. 22, T. 2 N., R. 1 W., S. B. & M., for storage purposes for irrigation and recreation use. Estimated cost \$136,389.

LOS ANGELES COUNTY—Porter Estate Dam No. 775. E. C. Porter Estate, a corporation, San Francisco, owner; earthen, 50 feet above streambed. Situated in Sec. 9, T. 2 N., R. 16 W., S. B. & M., for storage purposes for irrigation use.

MODOC COUNTY—J. L. Porter Dam No. 162. Pearl F. Porter, Alturas, owner; earth and rock fill, 20 feet above streambed with a storage capacity of 200 acre-feet. Situated on a small ditch tributary to Parker Creek in Sec. 12, T. 42 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$2,000.

INYO COUNTY—North Lake Dam No. 101-7. Nevada-California Power Company, Riverside, owner; earthen, 11 feet above streambed with a storage capacity of 85 acre-feet. Situated on North Fork of Bishop Creek tributary to Bishop Creek in Sec. 30, T. 8 S., R. 31 E., M. D. M., for storage purposes for power and irrigation use.

SAN DIEGO COUNTY—Upper Four Ess Dam No. 842. Albert E. Smith, Escondido, owner; concrete, 34 feet above streambed with a storage capacity of 200 acre-feet. Situated on an unnamed creek tributary to San Diequito River for storage purposes for irrigation use. Estimated cost \$25,000.

SAN DIEGO COUNTY—Lower Four Ess Dam No. 841-2. Albert E. Smith, Escondido, owner; concrete, 21 feet above streambed with a storage capacity of 100

acre-feet. Situated on an unnamed creek tributary to San Miguel River for storage purposes for irrigation use. Estimated cost \$7,000.

MODOC COUNTY—Williams Dam No. 149. J. Sheldon Potter, 315 Montgomery St., San Francisco, owner; rockfill, 4 feet above streambed with a storage capacity of 1495.5 acre-feet. Situated on no stream in Sec. 29, T. 43 N., R. 9 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$500.

MODOC COUNTY—Duncan Dam No. 149-2. J. Sheldon Potter, 315 Montgomery St., San Francisco, owner; earthfill 14 feet above streambed with a storage capacity of 2575 acre-feet. Situated on no stream in Sec. 33, T. 43 N., R. 9 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$6,200.

MODOC COUNTY—Jack's Swamp Dam No. 149-3. J. Sheldon Potter, 315 Montgomery St., San Francisco, owner; rockfill, 6 feet above streambed with a storage capacity of 150 acre-feet. Situated on no stream in Sec. 28, T. 43 N., R. 10 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$750.

MODOC COUNTY—Nelson Spring Dam No. 137. J. D. Flournoy Company, Likely, owner; earthfill, 118 feet above streambed with a storage capacity of 60 acre-feet. Situated on Nelson Spring tributary to Romero Gulch in Sec. 33, T. 40 N., R. 13 E., M. D. M., for storage purposes for irrigation use.

LASSEN COUNTY—Antelope Dam No. 242. Pierre Ducasse, Termo, owner; earthfill, 20 feet above streambed. Situated on Madeline Plains tributary to Antelope Creek in Sec. 3, T. 34 N., R. 13 E., M. D. M. Estimated cost \$12,000.

KERN COUNTY—Buena Vista Dam No. 732. Miller & Lux and Kern County Land Company, Bakersfield, owner; earthfill, 15 feet above streambed with a storage capacity of 205,000 acre-feet. Situated on Buena Vista Slough tributary to Kern River in Sec. 18, T. 31 S., R. 26 E., M. D. M., for storage purposes for irrigation use.

YUBA COUNTY—Depot Hill Dam No. 333. F. J. Joubert, Comptonville, owner; arch, 63 feet above streambed. Situated on Willow Creek tributary to North Fork of Yuba River in T. 19 N., R. 8 E., M. D. M., for storage purposes for debris use. Estimated cost \$22,000.

SAN JOAQUIN COUNTY—Woodbridge Diversion Dam No. 71. Woodbridge Irrigation District, Woodbridge, owner; gravity, 23.5 feet above streambed with a storage capacity of 2463.5 acre-feet. Situated on Mokelumne River tributary to San Joaquin River in Sec. 35, T. 4 N., R. 6 E., M. D. M., for diversion purposes for irrigation use. Estimated cost \$40,549.67.

PLUMAS COUNTY—Hydraulic King Dam No. 278. G. W. Fagg, Meadow Valley, owner; arch, 30 feet above streambed with a storage capacity of 15 acre-feet. Situated on Willow Creek tributary to Middle Fork Feather River in Sec. 14, T. 23 N., R. 7 E., M. D. M., for storage purposes for debris use. Estimated cost \$5,700.

YUBA COUNTY—Colgate Head Dam No. 97-2. Pacific Gas & Electric Company, San Francisco, owner; arch, 41 feet above streambed. Situated on North Fork of Yuba River tributary to Yuba River in Sec. 25, T. 18 N., R. 7 E., M. D. M., for diversion purposes for power use. Estimated cost \$65,000.

BUTTE COUNTY—Butte Creek Head Dam No. 97-4. Pacific Gas & Electric Company, San Francisco, owner; arch, 45 feet above streambed. Situated on Butte Creek tributary to Sacramento River in Sec. 36, T. 25 N., R. 3 E., M. D. M., for diversion purposes for power use. Estimated cost \$13,100.

BUTTE COUNTY—Hendricks Head Dam No. 97-6. Pacific Gas & Electric Company, San Francisco, owner; arch, 152 feet above streambed. Situated on West Branch of North Fork of Feather River tributary to Feather River in Sec. 16, T. 24 N., R. 4 E., M. D. M., for diversion purposes for power use. Estimated cost \$15,500.

NEVADA AND PLACER COUNTIES—Bear River Head Dam No. 97-11. Pacific Gas & Electric Company, San Francisco, owner; gravity, 18 feet above streambed. Situated on Bear River tributary to Yuba River in Sec. 22, T. 15 N., R. 9 E., M. D. M., for diversion purposes for power use. Estimated cost \$50,500.

PLACER COUNTY—Kelly Lake Dam No. 97-24. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 17 feet above streambed with a storage capacity of 360 acre-feet. Situated on Six-mile Valley tributary to North Fork of American River in Sec. 25, T. 17 N., R. 12 E., M. D. M., for storage purposes for irrigation and domestic use. Estimated cost \$3,000.

PLACER COUNTY—Lake Alta Dam No. 97-26. Pacific Gas & Electric Company, San Francisco,

owner; earthfill, 16.3 and 11.5 feet above streambed with a storage capacity of 270 acre-feet. Situated on an unnamed creek tributary to Bear River in Sec. 35, T. 16 N., R. 10 E., M. D. M., for regulation purposes for irrigation and domestic use. Estimated cost \$32,267.

PLACER COUNTY—Lake Arthur Dam No. 97-27. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 31 feet above streambed with a storage capacity of 94 acre-feet. Situated on South Fork of Dry Creek tributary to Yuba River in Sec. 19, T. 13 N., R. 9 E., M. D. M., for regulation purposes for irrigation and domestic use. Estimated cost \$38,738.

PLACER COUNTY—Lake Theodore Dam No. 97-31. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 31 feet above streambed with a storage capacity of 344.3 acre-feet. Situated on South Fork of Dry Creek tributary to Yuba River in Sec. 18, T. 15 N., R. 10 E., M. D. M., for storage purposes for irrigation and domestic use. Estimated cost \$38,872.

PLACER COUNTY—Wise Forebay Dam No. 97-50. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 16 feet above streambed with a storage capacity of 41.3 acre-feet. Situated on no stream in Sec. 4, T. 12 N., R. 8 E., M. D. M., for regulation purposes for power use. Estimated cost \$133,898.

TUOLUMNE COUNTY—Main Strawberry Dam No. 97-74. Pacific Gas & Electric Company, San Francisco, owner; rockfill, 132 feet above streambed with a storage capacity of 17,900 acre-feet. Situated on South Fork of Soledad River tributary to Crocker-Huffman River in Sec. 15, T. 4 N., R. 18 E., M. D. M., for storage purposes for power use. Estimated cost \$985,000.

SHASTA COUNTY—Manzanita Lake Dam No. 97-95. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 13 feet above streambed with a storage capacity of 500 acre-feet. Situated on Manzanita Creek tributary to North Battle Creek in Sec. 18, T. 31 N., R. 4 E., M. D. M., for storage purposes for power use. Estimated cost \$3,719.

BUTTE COUNTY—Pound Valley Dam No. 97-9. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 22 feet above streambed with a storage capacity of 1285 acre-feet. Situated on West Branch of North Fork of Feather River tributary to Feather River in Sec. 30, T. 26 N., R. 5 E., M. D. M., for storage purposes for power use. Estimated cost \$35,576.

LASSEN COUNTY—Coyote Flat Dam No. 233. C. W. Clarke Company, San Francisco, owner; earthfill, 36 feet above streambed with a storage capacity of 506 acre-feet. Situated on Coyote Creek tributary to Horse Creek in Sec. 31, T. 36 N., R. 9 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$27,469.84.

LOS ANGELES COUNTY—Devils Gate Dam No. 32-3. Los Angeles County Flood Control District, Los Angeles, owner; arch, 84 feet above streambed with a storage capacity of 7650 acre-feet. Situated on Arroyo Seco tributary to Los Angeles River in Sec. 7, T. 1 N., R. 12 S., B. M., for storage purposes for flood control use. Estimated cost \$455,350.

NAPA COUNTY—St. Helena Upper Dam No. 16. Town of St. Helena, St. Helena, owner; earthfill, 30 feet above streambed with a storage capacity of 30 acre-feet. Situated on York Creek tributary to Napa River in Sec. 27, T. 8 N., R. 6 W., M. D. M., for diversion and storage purposes for municipal use.

NAPA COUNTY—St. Helena Lower Reservoir No. 16-2. Town of St. Helena, St. Helena, owner; earthfill, 32 feet above streambed with a storage capacity of 123 acre-feet. Situated on York Creek tributary to Napa River located on Rancho Carne Hunoma for storage purposes for municipal use.

MODOC COUNTY—Hackmore Flat Dam No. 123. C. P. and J. L. Haskins, Merrill, owner; earthfill, 11 feet above streambed with a storage capacity of 552 acre-feet. Situated on hole in the Rock Canyon for storage purposes for stock-watering use.

MODOC COUNTY—Kelley A Dam No. 152-A. John Kelley and Gus Meckfessel, Alturas, owner; earthfill, 7.7 feet above streambed with a storage capacity of 1428 acre-feet. Situated on Canyon Creek and Pit River in Sec. 6, T. 41 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

MODOC COUNTY—Kelley B Dam No. 152-B. John Kelley and Gus Meckfessel, Alturas, owner; earthfill, 8.5 feet above streambed with a storage capacity of 1428 acre-feet. Situated on Canyon Creek and Pit River for storage purposes for irrigation use.

MODOC COUNTY—Kelley C Dam No. 152-C. John Kelley and Gus Meckfessel, Alturas, owner; earthfill, 3.7 feet above streambed with a storage capacity of 1428 acre-feet. Situated on Canyon Creek and Pit

River in Sec. 7, T. 41 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

ORANGE COUNTY—Modjeska Reservoir Dam No. 792. Modjeska Ranch Company, Crestline, owner; arch, 28.5 feet above streambed with a storage capacity of 23 acre-feet. Situated on Harding Creek tributary to Santiago Creek in Sec. 28, T. 5 S., R. 7 W., S. B. M., for storage purposes for domestic and irrigation use.

LOS ANGELES COUNTY—Burbank No. 4 Dam No. 4-4. City of Burbank, Burbank, owner; earthfill, 20 feet above streambed with a storage capacity of 21,177 acre-feet. Situated in Sec. 1, T. 1 N., R. 14 W., S. B. M., for storage purposes for municipal use. Estimated cost \$91,357.

BUTTE COUNTY—Lake Wyandotte Dam No. 63. Oroville-Wyandotte Irrigation District, Oroville, owner; earthfill, 41 feet above streambed with a storage capacity of 1300 acre-feet. Situated on North Honcut Creek tributary to Feather River in Sec. 16, T. 19 N., R. 5 E., for storage purposes for irrigation use. Estimated cost \$61,000.

BUTTE COUNTY—Lost Creek Dam No. 63-2. Oroville-Wyandotte Irrigation District, Oroville, owner; earthfill, 12 feet above streambed with a storage capacity of 6200 acre-feet. Situated on Lost Creek tributary to South Fork of Feather River in Sec. 24, T. 20 N., R. 5 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$191,300.

PLACER COUNTY—Millers Defeat Dam No. 322. Miller's Defeat Mining Company, Bolinas, owner; located in Sec. 28, T. 15 R. 13 E., M. D. M., for storage purposes for mining use.

MARIN COUNTY—Belvedere Dam No. 33-4. Marin Municipal Water District, San Rafael, owner; earthfill, 23 feet above streambed with a storage capacity of 23 acre-feet. Situated on a gulch tributary to San Francisco Bay for regulation purposes for domestic use. Estimated cost \$35,000.

MARIN COUNTY—Cascade Dam No. 33-5. Marin Municipal Water District, San Rafael, owner; buttress, 25 feet above streambed with a storage capacity of 5 acre-feet. Situated on Mill Creek tributary to San Francisco Bay for storage purposes for domestic use. Estimated cost \$16,000.

INYO COUNTY—Longley Reservoir Dam No. 100-2. Hillsdale Water Company, Riverside, owner; earth and rockfill, 20 feet above streambed with a storage capacity of 155 acre-feet. Situated on Ogden Creek tributary to Owens River in Sec. 2, T. 8 S., R. 30 E., M. D. M., for storage purposes for irrigation use.

AMADOR COUNTY—Elephant Mine Dam No. 474. J. W. Preston, Jr., San Francisco, owner; earthfill, 32 feet above streambed with a storage capacity of 6 acre-feet. Situated on Indian Flat tributary to Sutter Creek in Sec. 23, T. 7 N., R. 12 E., M. D. M., for storage purposes for mining use.

ALAMEDA COUNTY—Calaveras Dam No. 10. Spring Valley Water Company, San Francisco, owner; earthfill, 185 feet above streambed with a storage capacity of 100,000 acre-feet. Situated on Calaveras Creek tributary to Alameda Creek in Sec. 13, T. 5 S., R. 1 E., for storage purposes for domestic use. Estimated cost \$3,888,125.53.

SAN FRANCISCO COUNTY—College Hill Dam No. 10-2. Spring Valley Water Company, San Francisco, owner; earthfill, 16 feet above streambed with a storage capacity of 41.5 acre-feet. Situated on no stream for distributing purposes for domestic use.

SAN MATEO COUNTY—Lower Crystal Springs Dam No. 10-6. Spring Valley Water Company, San Francisco, owner; concrete, 131 feet above streambed with a storage capacity of 54,000 acre-feet. Situated on San Mateo Creek in Sec. 1, T. 5 S., R. 5 W., M. D. M., for storage purposes for domestic use.

ALAMEDA COUNTY—Niles Dam No. 10-7. Spring Valley Water Company, San Francisco, owner; earthfill, 16 feet above streambed with a storage capacity of 15 acre-feet. Situated on no stream in Sec. 15, T. 4 S., R. 1 W., M. D. M., for regulation purposes for domestic use. Estimated cost \$73,500.

SAN MATEO COUNTY—Pilarcitos Dam No. 10-8. Spring Valley Water Company, San Francisco, owner; earthfill, 74.25 feet above streambed with a storage capacity of 3100 acre-feet. Situated on Pilarcitos Creek in Sec. 33, T. 4 S., R. 5 W., M. D. M., for storage purposes for domestic use.

SAN MATEO COUNTY—San Andreas Dam No. 10-10. Spring Valley Water Company, San Francisco, owner; earthfill, 90 feet above streambed with a storage capacity of 18,500 acre-feet. Situated on San Andreas Creek tributary to San Mateo Creek in Sec. 16, T. 4 S., R. 5 W., M. D. M., for storage purposes for domestic use.

SAN MATEO COUNTY—San Mateo Creek No. 1 Dam No. 10-11. Spring Valley Water Company, San Francisco, owner; earthfill, 13 feet above streambed. Situated on San Mateo Creek in Sec. 28, T. 4 S., R. 5 W., M. D. M., for diversion purposes for domestic use.

SAN MATEO COUNTY—San Mateo Creek No. 2 Dam No. 10-12. Spring Valley Water Company, San Francisco, owner; arch, 24.5 feet above streambed. Situated on San Mateo Creek in Sec. 33, T. 4 S., R. 5 W., M. D. M., for diversion purposes for domestic use.

SAN FRANCISCO COUNTY—Stanford Heights Dam No. 10-13. Spring Valley Water Company, San Francisco, owner; earthfill, 20 feet high with a storage capacity of 34 acre-feet. Situated on no stream for regulation purposes for domestic use. Estimated cost \$125,000.

SAN MATEO COUNTY—Stone Dam No. 10-14. Spring Valley Water Company, San Francisco, owner; arch, 22 feet above streambed. Situated on Pilarcitos Creek in Sec. 3, T. 5 S., R. 5 W., M. D. M., for diversion purposes for domestic use.

SAN FRANCISCO COUNTY—University Mound Dam No. 10-15. Spring Valley Water Company, San Francisco, owner; earthfill, 26 feet high with a storage capacity of 132 acre-feet. Situated on no stream for regulation purposes for domestic use.

SAN MATEO COUNTY—Upper Crystal Springs Dam No. 10-16. Spring Valley Water Company, San Francisco, owner; earthfill, 55 feet above streambed with a storage capacity of 3,500 acre-feet. Situated on Laguna Creek tributary to San Mateo Creek in Sec. 12, T. 5 S., R. 5 W., M. D. M., for storage purposes for domestic use.

ALAMEDA COUNTY—Sunol Dam No. 10-17. Spring Valley Water Company, San Francisco, owner; gravity, 1 foot above streambed. Situated on Alameda Creek in Sec. 7, T. 4 S., R. 1 E., M. D. M., for diversion purposes for domestic use.

LOS ANGELES COUNTY—Stone Canyon Dam No. 6-25. City of Los Angeles, Los Angeles, owner; earthfill, 154 feet above streambed with a storage capacity of 7960 acre-feet. Situated on Stone Canyon in T. 1 S., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$613,727.

LOS ANGELES COUNTY—Sawtelle Pressure Break Dam No. 6-21. City of Los Angeles, Los Angeles, owner; earthfill, 401 feet above streambed with a storage capacity of 109.98 acre-feet. Located in T. 1 S., R. 15 W., S. B. M., for regulation purposes for municipal use. Estimated cost \$63,156.

PLUMAS COUNTY—Little Grizzly Dam No. 272. Wm. and E. J. Currier, Milpitas, owners; rockfill, 23 feet above streambed. Situated on Little Grizzly Creek tributary to Indian Creek and Feather River for storage purposes for debris use.

SACRAMENTO AND PLACER COUNTIES—Baldwin Dam No. 324-2. North Fork Ditch Company, Sacramento, owner; earthfill, 37 feet above streambed with a storage capacity of 305.4 acre-feet. Situated on unnamed creek tributary to Linda Creek in Sec. 14, T. 10 N., R. 1 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$53,214.95.

SAN MATEO COUNTY—Millbrae No. 1 Dam No. 618. Mills Estate, Inc., San Francisco, owner; earthfill, 36 feet above streambed with a storage capacity of 22.54 acre-feet. Situated on an unnamed creek for storage and diversion purposes for irrigation use.

SAN MATEO COUNTY—Millbrae No. 2 Dam No. 618-2. Mills Estate, Inc., San Francisco, owner; earthfill, 33 feet above streambed. Situated on an unnamed creek for storage and diversion purposes for irrigation use.

SAN MATEO COUNTY—Millbrae No. 3 Dam No. 618-3. Mills Estate, Inc., San Francisco, owner; earthfill, 37 feet above streambed with a storage capacity of 27.55 acre-feet. Situated on an unnamed creek for storage and diversion purposes for irrigation use. Estimated cost \$19,453.

PLUMAS COUNTY—Silver Lake Dam No. 274. Spanish Peak Lumber Company, San Francisco, owner; earth and rockfill, 15.0 feet above streambed with a storage capacity of 650 acre-feet. Situated on Silver Creek tributary to Spanish Creek in Sec. 1, T. 24 N., R. 7 E., M. D. M., for storage purposes for logging use. Estimated cost \$2,000.

MODOC COUNTY—Boles Meadow Dam No. 145-6. G. O. Tranzetta, Alturas, owner; rockfill, 10 feet above streambed. Situated on Boles Meadow tributary to Triangle Ranch in Sec. 15, T. 45 N., R. 9 E., M. D. M., for storage purposes for irrigation use.

FRESNO COUNTY—Ten Mile Dam No. 692. Sanger Lumber Company, Sanger, owner; multiple arch, 48 feet above streambed with a storage capacity of 1410 acre-feet. Situated on Ten Mile Creek tributary to

Kings River in Sec. 14, T. 13 S., R. 28 E., M. D. M., for storage purposes for logging use. Estimated cost \$90,000.

NAPA COUNTY—Veterans' Home Storage Dam No. 1-14. State of California Veterans' Home, Veterans' Home, Napa County, owner; earthenfill, 43 feet above streambed with a storage capacity of 39 acre-feet. Situated on Overholt Creek tributary to Napa River for storage purposes for fire protection and irrigation use.

RIVERSIDE COUNTY—Railroad Canyon Dam No. 318. Temescal Water Company, Corona, owner; earthenfill, 70 feet above streambed with a storage capacity of 12,000 acre-feet. Situated on San Jacinto tributary to Lake Elsinore and Santa Ana River in Sec. 2, T. 6 S., R. 4 W., S. B. M., for storage purposes for irrigation use. Estimated cost, \$268,500.

RIVERSIDE COUNTY—Lee Lake Dam No. 818-2. Temescal Water Company, Corona, owner; earthenfill, 20 feet above streambed with a storage capacity of 1600 acre-feet. Situated on Temescal Creek tributary to Santa Ana River in Sec. 7, T. 5 S., R. 15 W., S. B. M., for storage purposes for irrigation use. Estimated cost \$26,778.62.

TUOLUMNE COUNTY—Standard Log Pond Dam No. 144-2. Pickering Lumber Company, Standard, owner; gravity, 20 feet above streambed with a storage capacity of 71 acre-feet. Situated on North Fork of Curtis Creek tributary to Curtis Creek in Sec. 3, T. 1 N., R. 15 E., M. D. M., for storage purposes for logging use. Estimated cost \$82,000.

TUOLUMNE COUNTY—Tuolumne Log Pond Dam No. 144-3. Pickering Lumber Company, Standard, owner; gravity, 20 feet above streambed with a storage capacity of 120 acre-feet. Situated on Turnback Creek tributary to Tuolumne River in Sec. 8, T. 1 N., R. 16 E., M. D. M., for storage purposes for log pond use. Estimated cost \$102,000.

NEVADA COUNTY—Lake Angela Dam No. 311. Central Pacific Railway Company, San Francisco, owner; earth and concrete, 6 feet above streambed with a storage capacity of 135 acre-feet. Situated on a small stream tributary to South Yuba River, in Sec. 17, T. 17 N., R. 15 E., M. D. M., for storage and diversion purposes for locomotive and domestic use.

NEVADA COUNTY—Crystal Lake Dam No. 311-2. Central Pacific Railway Company, San Francisco, owner; gravity, 9.5 feet above streambed with a storage capacity of 200 acre-feet. Situated on a small creek tributary to South Fork Yuba River in Sec. 24, T. 17 N., R. 12 E., M. D. M., for storage and diversion purposes for locomotive and domestic use. Estimated cost \$14,660.

PLACER COUNTY—Lake Mary Dam No. 311-3. Central Pacific Railway Company, San Francisco, owner; earthenfill, 9 feet above streambed with a storage capacity of 172 acre-feet. Situated on a small stream tributary to South Yuba River in Sec. 20, T. 17 N., R. 15 E., M. D. M., for storage and diversion purposes for locomotive and domestic use. Estimated cost \$22,353.

PLACER COUNTY—Putts Lake, West Dam No. 311-4. Central Pacific Railway Company, San Francisco, owner; earthenfill, 12 feet above streambed with a storage capacity of 249 acre-feet. Situated on Blue Canyon Creek tributary to North Fork of North Fork of American River in Sec. 36, T. 17 N., R. 11 E., M. D. M., for storage and diversion purposes for locomotive and domestic use. Estimated cost \$12,569.

PLACER COUNTY—Putts Lake East Dam No. 311-5. Central Pacific Railway Company of San Francisco, owner; earthenfill, 4 feet above streambed with a storage capacity of 249 acre-feet. Situated on Blue Canon Creek tributary to North Fork of North Fork of American River in Sec. 36, T. 17 N., R. 11 E., M. D. M., for storage and diversion purposes for locomotive and domestic use. Estimated cost \$3,360.

PLACER COUNTY—Campbells Lake Upper Dam No. 311-6. Central Pacific Railway Company, San Francisco, owner; masonry, 11 feet above streambed with a storage capacity of 96.7 acre-feet. Situated on a stream tributary to South Fork of Yuba River in Sec. 30, T. 17 N., R. 13 E., M. D. M., for storage and diversion purposes for locomotive and domestic use.

PLACER COUNTY—Campbells Lake Lower Dam No. 311-7. Central Pacific Railway Company, San Francisco, owner; gravity, 12 feet above streambed with a storage capacity of 19.15 acre-feet. Situated on a small creek tributary to South Fork of Yuba River in Sec. 30, T. 17 N., R. 13 E., M. D. M., for storage and diversion purposes for locomotive and domestic use. Estimated cost \$34,350.

PLACER AND EL DORADO COUNTIES—Diversión Dam No. 324. North Fork Ditch Company, Sacramento, owner; gravity, 16 feet above streambed. Situated on North Fork American River tributary to

American River in Sec. 23, T. 12 N., R. 8 E., M. D. M., for diversion purposes for irrigation use. Estimated cost \$75,000.

SACRAMENTO AND PLACER COUNTIES—Hinkle Dam No. 324-3. North Fork Ditch Company, Sacramento, owner; earthenfill, 14.6 feet above streambed with a storage capacity of 47 acre-feet. Situated on North Fork Canal in Sec. 24, T. 10 N., R. 7 E., for regulation purposes for irrigation use. Estimated cost \$4,500.

MODOC COUNTY—Big Sage Dam No. 55. Hot Spring Valley Irrigation District, Alturas, for storage purposes for irrigation use.

LOS ANGELES COUNTY—Sawtelle Pressure Break Dam No. 6-21. City of Los Angeles, Los Angeles, owner; earthenfill, 22 feet high with a storage capacity of 109.88 acre-feet. Situated on no stream in T. 1 S., R. 15 W., S. B. M., for regulation purposes for municipal use. Estimated cost \$63,156.

LOS ANGELES COUNTY—Stone Canyon Dam No. 6-25. City of Los Angeles, Los Angeles, owner; earthenfill, 154 feet above streambed with a storage capacity of 109.88 acre-feet. Situated on Stone Canyon, T. 1 S., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$613,727.

LOS ANGELES COUNTY—Maclay Dam No. 6-9. City of Los Angeles, Los Angeles, owner; earth reservoir, 15.14 feet high with a storage capacity of 18.75 acre-feet. Situated on no stream in Sec. 23, T. 3 N., R. 15 W., S. B. M., for storage purposes for municipal use. Estimated cost \$22,800.

TUOLUMNE COUNTY—Early Intake Dam No. 9. City and County of San Francisco, San Francisco, owner; arch, 41 feet above streambed with a storage capacity of 115 acre-feet. Situated on Tuolumne River tributary to San Joaquin River in Sec. 11, T. 1 S., R. 18 E., M. D. M., for diversion purposes for domestic and power use. Estimated cost \$500,000.

TUOLUMNE COUNTY—Eleanor Dam No. 9-2. City and County of San Francisco, San Francisco, owner; arch, 57 feet above streambed with a storage capacity of 27,800 acre-feet. Situated on Eleanor Creek tributary to Cherry Creek and Tuolumne River in Sec. 2, T. 1 N., R. 15 E., M. D. M., for storage purposes for municipal and power use. Estimated cost \$320,000.

TUOLUMNE COUNTY—O'Shaughnessy Dam No. 9-5. City and County of San Francisco, San Francisco, owner; arched gravity, 220 feet above streambed with a storage capacity of 266,000 acre-feet. Situated on Tuolumne River tributary to San Joaquin River in Sec. 16, T. 1 N., R. 20 E., M. D. M., for storage purposes for municipal and power use. Estimated cost \$7,000,000.

TUOLUMNE COUNTY—Priest Dam No. 9-6. City and County of San Francisco, San Francisco, owner; arch and earthenfill, 140 feet above streambed with a storage capacity of 2350 acre-feet. Situated on Rattlesnake Creek tributary to Moccasin Creek and Tuolumne River in Sec. 31, T. 1 S., R. 16 E., M. D. M., for diversion purposes for municipal power use. Estimated cost \$1,000,000.

LOS ANGELES COUNTY—Girard Dam No. 6-10. City of Los Angeles, Los Angeles, owner; earthenfill, 28.2 feet high with a storage capacity of 40.8 acre-feet. Situated on no stream in Sec. 24, T. 1 N., R. 17 W., S. B. M., for storage purposes for municipal use. Estimated cost \$40,830.

LOS ANGELES COUNTY—Solano Dam No. 6-22. City of Los Angeles, Los Angeles, owner; earthenfill, 19.42 feet high with a storage capacity of 16.53 acre-feet. Situated on no stream in T. 1 S., R. 13 W., S. B. M., for storage purposes for municipal use.

MODOC COUNTY—Essex Dam No. 121-2. S. X. Ranch, Alturas, owner; earthenfill, 37 feet above streambed with a storage capacity of 2000 acre-feet. Situated on no stream in T. 43 N., R. 17 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—Neece and West Dam No. 308. You Bet Mining Company, Denver, Colorado, owner; log type. Situated on Birdseye Canyon in Sec. 31, T. 16 N., R. 10 E., for storage purposes for debris use.

NEVADA COUNTY—Nevada Dam No. 308-2. You Bet Mining Company, Denver, Colorado, owner; log type. Situated on Greenhorn Creek tributary to Bear River in Sec. 2, T. 15 N., R. 9 E., for storage purposes for debris use.

NEVADA COUNTY—Chalk Bluff Dam No. 308-3. You Bet Mining Company, Denver, Colorado, owner; earthenfill, with a storage capacity of 42 acre-feet. Situated on no stream tributary to Missouri Canyon in Sec. 31, T. 6 N., R. 10 E., M. D. M.

NEVADA COUNTY—Wallopa Dam No. 308-4. You Bet Mining Company, Denver, Colorado, owner. Situated on North Fork American River tributary to

ated on no stream tributary to Birdseye Canyon in Sec. 6, T. 15 N., R. 10 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Upper Sardine Lake Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owner; rock fill, 23 feet above streambed. Situated on outlet to Sardine Lake tributary to North Fork of Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. M., for storage purposes for power use.

FRESNO COUNTY—Bear Creek Diversion Dam No. 104. Southern California Edison Company, Los Angeles, owner; arch, 45 feet above streambed with a storage capacity of 103 acre-feet. Situated on Big Creek tributary to San Joaquin River in Sec. 12, T. 7 E., R. 27 E., M. D. M., for diversion purposes for power use.

KERN COUNTY—Diversion Dam No. 1 No. 104-2. Southern California Edison Company, Los Angeles, owner; gravity, 28 feet above streambed. Situated on Kern River in Sec. 5, T. 28 S., R. 31 E., M. D. M., for diversion purposes for power use.

TULARE COUNTY—Diversion Dam No. 3 No. 104-3. Southern California Edison Company, Los Angeles, owner; gravity, 17 feet above streambed with a storage capacity of 49 acre-feet. Situated on Kern River in Sec. 12, T. 25 S., R. 32 E., M. D. M., for diversion purposes for power use.

FRESNO COUNTY—Big Creek Diversion Dam No. 4 No. 104-4. Southern California Edison Company, Los Angeles, owner; arch, 63 feet above streambed with a storage capacity of 100 acre-feet. Situated on Big Creek tributary to San Joaquin River in Sec. 28, T. 8 S., R. 25 E., M. D. M., for diversion purposes for power use.

FRESNO COUNTY—Big Creek Diversion No. 5 Dam No. 104-5. Southern California Edison Company, Los Angeles, owner; arch, 44 feet above streambed with a storage capacity of 42 acre-feet. Situated on Big Creek tributary to San Joaquin River in Sec. 26, T. 8 S., R. 24 E., M. D. M., for diversion purposes for power use.

FRESNO AND MADERA COUNTIES—Big Creek Dam No. 6 No. 104-6. Southern California Edison Company, Los Angeles, owner; arch, 130 feet above streambed with a storage capacity of 992 acre-feet. Situated on San Joaquin River in Sec. 27, T. 8 S., R. 24 E., M. D. M., for diversion purposes for power use.

TULARE COUNTY—Eagle Lake Dam No. 104-7. Southern California Edison Company, Los Angeles, owner; gravity, 14 feet above streambed with a storage capacity of 209 acre-feet. Situated on East Fork tributary to Kaweah River in Sec. 28, T. 17 S., R. 31 E., M. D. M., for storage purposes for power use.

KERN COUNTY—Headwork and Embankment Dam No. 104-8. Southern California Edison Company, Los Angeles, owner; earthen, 11.5 feet above streambed with a storage capacity of 92 acre-feet. Situated on Kern River in Sec. 33, T. 25 S., R. 33 E., M. D. M., for storage purposes for power use.

FRESNO COUNTY—Florence Lake Dam No. 104-9. Southern California Edison Company, Los Angeles, owner; multiple arch, 149 feet above streambed with a storage capacity of 64,406 acre-feet. Situated on South Fork of San Joaquin River tributary to San Joaquin River in Sec. 36, T. 7 S., R. 27 E., M. D. M., for storage and diversion purposes for power use.

FRESNO COUNTY—Huntington Lake Reservoir Dam No. 1 No. 104-10A. Southern California Edison Company, Los Angeles, owner; gravity arch, 155 feet above streambed. Situated on Big Creek tributary to San Joaquin River in Sec. 14, T. 8 S., R. 22 E., M. D. M., for storage and diversion purposes for power use.

FRESNO COUNTY—Huntington Lake No. 2 Dam No. 104-10B. Southern California Edison Company, Los Angeles, owner; arch gravity, 89½ feet above streambed with a storage capacity of 88,834 acre-feet. Situated on Big Creek tributary to San Joaquin River in Sec. 15, T. 8 S., R. 25 E., M. D. M., for storage and diversion purposes for power use.

FRESNO COUNTY—Huntington Lake No. 3A Dam No. 104-10C. Southern California Edison Company, Los Angeles, owner; gravity, 7 feet above streambed with a storage capacity of 88,834 acre-feet. Situated on Big Creek tributary to San Joaquin River in Sec. 22, T. 8 S., R. 25 E., M. D. M., for storage and diversion purposes for power use.

FRESNO COUNTY—Huntington Lake Reservoir No. 3 No. 104-10D. Southern California Edison Company, Los Angeles, owner; gravity arch, 84 feet above streambed with a storage capacity of 88,834 acre-feet. Situated on Big Creek tributary to San Joaquin River

in Sec. 22, T. 8 S., R. 25, for storage and diversion purposes for power use.

TULARE COUNTY—Lady Franklin Lake Dam No. 104-11. Southern California Edison Company, Los Angeles, owner; buttress, 20 feet above streambed with a storage capacity of 167 acre-feet. Situated on East Fork tributary to Kaweah in Sec. 25, T. 17 S., R. 31 E., M. D. M., for storage purposes for power use.

FRESNO COUNTY—Mono Creek Diversion Dam No. 104-12. Southern California Edison Company, Los Angeles, owner; arch, 40 feet above streambed with a storage capacity of 45 acre-feet. Situated on Mono Creek tributary to San Joaquin River in Sec. 35, T. 6 S., R. 27 E., M. D. M., for diversion purposes for power use.

TULARE COUNTY—North Fork of Tule River Diversion Dam No. 104-13. Southern California Edison Company, Los Angeles, owner; gravity, 12 feet above streambed. Situated on North Fork of Middle Fork tributary to Tule River in Sec. 27, T. 20 S., R. 30 E., M. D. M., for diversion purposes for power use.

SAN BERNARDINO COUNTY—Petty Regulation Reservoir for Mill Creek No. 3 Dam No. 104-14. Southern California Edison Company, Los Angeles, owner; earthen, 64 feet above streambed. Situated on conduit of Mill Creek tributary to Santa Ana River in Sec. 17, T. 1 S., R. 1 W., S. B. M., for regulation purposes for power use.

SAN BERNARDINO COUNTY—Santa Ana Power House No. 1 Dam No. 104-16. Southern California Edison Company, Los Angeles, owner; gravity, 20 feet above streambed with a storage capacity of 4 acre-feet. Situated on conduit tributary to Santa Ana River in Sec. 19, T. 1 N., R. 1 W., S. B. M., for storage purposes for power use.

SAN BERNARDINO COUNTY—Santa Ana River Diversion Dam No. 104-17. Southern California Edison Company, Los Angeles, owner; gravity, 13 feet above streambed. Situated on Santa Ana River in Sec. 19, T. 1 N., R. 1 W., S. B. M., for diversion purposes for power use.

FRESNO COUNTY—Shaver Lake Dam No. 104-18. Southern California Edison Company, Los Angeles, owner; concrete gravity, 170 feet above streambed with a storage capacity of 135,283 acre-feet. Situated on Stevenson Creek tributary to San Joaquin River in Sec. 12, T. 9 S., R. 24 E., M. D. M., for storage and diversion purposes for power use.

TULARE COUNTY—Silver Lake Dam No. 104-19. Southern California Edison Company, Los Angeles, owner; buttress, 18 feet above streambed with a storage capacity of 162 acre-feet. Situated on East Fork tributary to Kaweah River in Sec. 24, T. 17 S., R. 31 E., M. D. M., for storage purposes for power use.

TULARE COUNTY—Upper Monarch Lake Dam No. 104-20. Southern California Edison Company, Los Angeles, owner; buttress, 21½ feet above streambed with a storage capacity of 31 acre-feet. Situated on East Fork tributary to Kaweah River in Sec. 13, T. 17 S., R. 31 E., M. D. M., for storage purposes for power use.

TULARE COUNTY—Kaweah No. 2 Dam No. 104-21. Southern California Edison Company, Los Angeles, owner; rockfill, 26 feet above streambed with a storage capacity of 11 acre-feet. Situated on conduit to Kaweah tributary to Kaweah River in Sec. 3, T. 17 S., R. 29 E., M. D. M., for regulation purposes for power use.

FRESNO COUNTY—Stevenson Creek Test Dam No. 691. Committee on Arch Dam Investigation, Los Angeles, owner; arch, 60 feet above streambed with a storage capacity of 3.4 acre-feet. Situated on Stevenson Creek tributary to San Joaquin River in Sec. 11, T. 9 S., R. 24 E., M. D. M., for experimental purposes.

SAN DIEGO COUNTY—Main Sweetwater Dam No. 840-A. Sweetwater Corporation, San Francisco, owner; arch, 90 feet above streambed with a storage capacity of 30,393 acre-feet. Situated on Sweetwater River in Rancho de la Nacion for storage purposes for domestic, irrigation, industrial and municipal uses. Estimated cost \$605,000.

SAN DIEGO COUNTY—Sweetwater South Dike Dam No. 840-B. Sweetwater Water Corporation, San Francisco, owner; earthen, 32 feet above streambed with a storage capacity of 30,393 acre-feet. Situated on no stream, tributary to Sweetwater River in Sec. 20, T. 17 S., R. 1 W., S. B. M., for storage purposes for domestic, irrigation, industrial and municipal uses. Estimated cost \$47,000.

SAN DIEGO COUNTY—Sweetwater Stilling Pool Dam No. 840-2. Sweetwater Water Corporation, San Francisco, owner; buttress, 16 feet above streambed. Situated on Sweetwater River in Rancho de la Nacion

for storage purposes for stilling pool use. Estimated cost \$13,600.

INYO COUNTY—Big Pine Dam No. 6-11. City of Los Angeles, Los Angeles, owner; rock crib, with a storage capacity of 1071 acre-feet. Situated on Big Pine Creek tributary to Owens River in Sec. 33, T. 9 S., R. 32 E., M. D. M., for storage purposes for power and irrigation use.

LOS ANGELES COUNTY—Drinkwater Dam No. 6-16. City of Los Angeles, Los Angeles, owner; earthfill, 65 feet above streambed with a storage capacity of 92.5 acre-feet. Situated on Drinkwater Canyon tributary to San Francisco Creek in Sec. 11, T. 5 N., R. 16 W., S. 13 M., for storage purposes for power and municipal use. Estimated cost \$120,000.

ALPINE COUNTY—Silver Valley Dam No. 99. Emma Rose and Hobart Estate Company, San Francisco, owners; earthfill, 45 feet above streambed with a storage capacity of 4600 acre-feet. Situated on North Fork tributary to Stanislaus River in Sec. 9, T. 7 N., R. 18 E., M. D. M., for storage purposes for power, domestic and irrigation use. Estimated cost \$106,767.

CALAVERAS COUNTY—Hunter Dam No. 99-2. Emma Rose and Hobart Estate Company, San Francisco, owners; arch, 50 feet above streambed with a storage capacity of 200 acre-feet. Situated on Mill Creek tributary to Stanislaus River in Sec. 18, T. 4 N., R. 15 E., M. D. M., for storage and diversion purposes for domestic, irrigation and power uses. Estimated cost, \$38,000.

CALAVERAS COUNTY—Ross Dam No. 99-3. Emma Rose and Hobart Estate Company, San Francisco, owners; arch, 26 feet above streambed with a storage capacity of 85 acre-feet. Situated on San Domingo Creek tributary to Calaveras River in Sec. 14, T. 3 N., R. 13 E., M. D. M., for storage and diversion purposes for power, irrigation and domestic use. Estimated cost \$51,195.

TUOLUMNE COUNTY—Union Dam No. 99-5. Emma Rose and Hobart Estate Company, San Francisco, owners; earthfill, 32 feet above streambed with a storage capacity of 2000 acre-feet. Situated on North Fork tributary to Stanislaus River in Sec. 28, T. 7 N., R. 18 E., M. D. M., for storage purposes for domestic, irrigation and power uses.

ALPINE COUNTY—Utica Dam No. 99-6. Emma Rose and Hobart Estate Company, San Francisco, owners; rockfill, 52 feet above streambed with a storage capacity of 2400 acre-feet. Situated on North Fork tributary to Stanislaus River in Sec. 21, T. 7 N., R. 18 E., M. D. M., for storage purposes for domestic, irrigation and power uses. Estimated cost \$54,275.

SAN MATEO COUNTY—Filoli Dam No. 617. Filoli Estate, San Mateo, owner; earthfill, 30 feet above streambed with a storage capacity of 1.3 acre-feet. Situated on branch of Laguna Creek tributary to San Mateo Creek in Sec. 30, T. 5 S., R. 4 W., M. D. M., for storage purposes for domestic and irrigation use.

BUTTE COUNTY—De Sable Forebay Dam No. 97-5. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 49½ feet high with a storage capacity of 280 acre-feet. Situated on Butte Creek canal in Sec. 11, T. 23 N., R. 3 E., M. D. M., for regulation purposes for power use. Estimated cost \$163,355.

BUTTE COUNTY—Kunkle Dam No. 97-7. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 44 feet above streambed with a storage capacity of 252½ acre-feet. Situated on Kunkle Creek tributary to West Branch of North Fork of Feather River in Sec. 24, T. 2 N., R. 1 E., M. D. M., for regulation purposes for power use. Estimated cost \$81,110.

NEVADA COUNTY—Culvertson Dam No. 97-17. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 14 feet above streambed with a storage capacity of 1079 acre-feet. Situated on branch of Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$3,580.

PLACER COUNTY—Lake Valley Dam No. 97-32. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 58 feet above streambed with a storage capacity of 127 acre-feet. Situated on branch of North Fork of American River tributary to American River in Sec. 35, T. 17 N., R. 12 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$203,648.

NEVADA COUNTY—Lake Van Norden Dam No. 97-33. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 25 feet above streambed with a storage capacity of 5874 acre-feet. Situated on South Yuba River tributary to Yuba River in Sec. 23, T. 17 N., R. 14 E., M. D. M., for storage purposes for power use. Estimated cost \$78,161.

NEVADA COUNTY—Lost River Dam No. 97-34. Pacific Gas & Electric Company, San Francisco, owner; rock crib, 11 feet above streambed with a storage capacity of 250 acre-feet. Situated on unnamed creek tributary to Fordyce Creek and South Yuba River in Sec. 2, T. 17 N., R. 13 E., M. D. M., for storage purposes for power use. Estimated cost \$600.

PLACER COUNTY—Lower Peak Dam No. 97-37. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 20 feet above streambed with a storage capacity of 45 acre-feet. Situated on unnamed stream tributary to South Yuba River in Sec. 30, T. 17 N., R. 14 E., M. D. M., for storage purposes for power use. Estimated cost \$12,672.

EL DORADO COUNTY—Echo Lake Dam No. 97-52. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 5 feet above streambed with a storage capacity of 1900 acre-feet. Situated on branch of Upper Truckee River tributary to Lake Tahoe in Sec. 1, T. 11 N., R. 17 E., M. D. M., for storage purposes for power use. Estimated cost \$10,000.

EL DORADO COUNTY—Medley Lakes Dam No. 97-57. Pacific Gas & Electric Company, San Francisco, owner; masonry, 11 feet above streambed with a storage capacity of 3350 acre-feet. Situated on tributary of South Fork of American River tributary to American River in Sec. 30, T. 12 N., R. 17 E., M. D. M., for storage purposes for power use. Estimated cost \$35,000.

AMADOR COUNTY—Amador Dam No. 97-60. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 14 feet above streambed with a storage capacity of 8.1 acre-feet. Situated on no stream in Sec. 6, T. 6 N., R. 11 E., M. D. M., for regulation purposes for mining, irrigation and domestic use. Estimated cost \$2,400.

AMADOR COUNTY—Tabeaud Dam No. 97-67. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 112 feet above streambed with a storage capacity of 1158 acre-feet. Situated on tributary of Jackson Creek tributary to Dry Creek in Sec. 28, T. 6 N., R. 12 E., M. D. M., for storage purposes for power use. Estimated cost \$219,951.

TUOLUMNE COUNTY—Sand Bar Dam No. 97-81. Pacific Gas & Electric Company, San Francisco, owner; rock crib, 26 feet above streambed with a storage capacity of 100 acre-feet. Situated on North Fork of Stanislaus River tributary to Stanislaus River in Sec. 24, T. 4 N., R. 16 E., M. D. M., for storage and diversion purposes for power use. Estimated cost \$52,700.

TUOLUMNE COUNTY—Upper Strawberry Dam No. 97-84. Pacific Gas & Electric Company, San Francisco, owner; crib, 28 feet above streambed with a storage capacity of 1180 acre-feet. Situated on South Fork Stanislaus River tributary to Stanislaus River in Sec. 14, T. 1 N., R. 18 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$31,430.

SHASTA COUNTY—Baldwin Dam No. 97-85. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 19 feet above streambed with a storage capacity of 100 acre-feet. Situated on no stream in Sec. 33, T. 31 N., R. 1 E., M. D. M., for regulation purposes for power use. Estimated cost \$11,650.

SHASTA COUNTY—Buckhorn Dam No. 97-86. Pacific Gas & Electric Company, San Francisco, owner; earth and rock fill, 12 feet above streambed with a storage capacity of 400 acre-feet. Situated on tributary of North Cow Creek tributary to Sacramento River in Sec. 19, T. 33 N., R. 2 E., M. D. M., for storage purposes for power use. Estimated cost \$300.

SHASTA COUNTY—Lake Nora Dam No. 97-93. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 10 feet high with a storage capacity of 14.9 acre-feet. Situated on no stream in Sec. 4, T. 30 N., R. 1 E., M. D. M., for regulation purposes for power use. Estimated cost \$10,100.

SIERRA COUNTY—Upper Sardine Lake Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owners; rockfill, 25 feet above streambed. Situated on outlet of Sardine Lake tributary to North Fork Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. M., for storage purposes for mining use.

MODOC COUNTY—Ess Ex Dam No. 121-2. S. X. Ranch Company, Alturas, owner; earthfill, 37 feet high with a storage capacity of 2000 acre-feet. Situated on no stream in T. 43 N., R. 17 E., M. D. M., for storage purposes for irrigation use.

NAPA COUNTY—Villa Del Rey Dam No. 412. J. G. Eccleston, St. Helena, owner; earthfill, 35 feet high with a storage capacity of 30 acre-feet. Situated on no creek for storage purposes for irrigation use.

SAN FRANCISCO COUNTY—Lombard St. Reservoir Dam No. 10-5. Spring Valley Water Company,

San Francisco, owner; earthfill, 17.5 feet high with a storage capacity of 8.3 acre-feet. Situated on no stream for distributing purposes for domestic use.

AMADOR COUNTY—Kennedy Dam No. 477. Kennedy Mining & Milling Company, San Francisco, owner; multiple arch, 50 feet above streambed with a storage capacity of 8 acre-feet. Situated on a ravine for storage purposes for debris use. Estimated cost \$74,294.25.

SAN MATEO COUNTY—Emerald Lake No. 1 Dam No. 612. Emerald Lake Country Club, Redwood City, owner; earth and rockfill, 41 feet above streambed with a storage capacity of 45 acre-feet. Situated on no stream for storage purposes for recreational use.

SAN MATEO COUNTY—Emerald Lake No. 2 Dam No. 612-2. Leonard & Holt, San Francisco, owners; earthfill, 21½ feet above streambed with a storage capacity of 42 acre-feet. Situated on no stream, for storage purposes for recreational use. Estimated cost \$8,500.

ALPINE COUNTY—Scott Lake Dam No. 511. Dressler, Settelmeyer & Neddernrip, Minden, Nevada, owners; earthfill, 23.5 feet above streambed with a storage capacity of 600 acre-feet. Situated on Scott Creek tributary to West Carson River in Sec. 2, T. 10 N., R. 18 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$7,500.

ALPINE COUNTY—Red Lake Dam No. 511-3. Dressler, Settelmeyer & Neddernrip, Minden, Nevada, owners; earthfill, 22 feet above streambed with a storage capacity of 900 acre-feet. Situated on Red Lake Creek tributary to West Carson River in Sec. 23, T. 10 N., R. 18 E., M. D. M., for storage purposes for irrigational use. Estimated cost \$14,000.

EL DORADO COUNTY—Fallen Leaf Dam No. 461. Anita M. Baldwin, Los Angeles, owner; gravity, 2 feet above streambed with a storage capacity of 1700 acre-feet. Situated on Taylor Creek tributary to Lake Tahoe in Sec. 1, T. 12 N., R. 17 E., M. D. M., for storage and diversion purposes for power, domestic and recreational uses. Estimated cost \$4,500.

LOS ANGELES COUNTY—Harold Dam No. 57-2. Palmdale Irrigation District, Palmdale, owner; earthfill, 35 feet above streambed with a storage capacity of 7424 acre-feet. Located in Sec. 3, T. 5 N., R. 12 W., S. B. M., for storage purposes for irrigation and domestic use. Estimated cost \$75,000.

LOS ANGELES COUNTY—Girard Dam No. 6-10. City of Los Angeles, Los Angeles, owner; earth rear, 28.2 feet high with a storage capacity of 40.5 acre-feet. Situated on no stream in Sec. 24, T. 1 N., R. 17 W., S. B. M., for storage purposes for municipal use. Estimated cost \$40,830.

LOS ANGELES COUNTY—Chatsworth No. 2 Dam No. 6-4A. City of Los Angeles, Los Angeles, owner; earthfill, 27 feet above streambed with a storage capacity of 7400 acre-feet. Situated on no stream tributary to Los Angeles River in Ex Mission de San Fernando for storage purposes for municipal use. Estimated cost \$202,200.

LOS ANGELES COUNTY—Chatsworth No. 3 Dam No. 6-4C. City of Los Angeles, Los Angeles, owner; earthfill, 37 feet above streambed with a storage capacity of 7400 acre-feet. Situated on canyon tributary to Los Angeles River in Ex Mission de San Fernando for storage purposes for municipal use. Estimated cost \$126,500.

ROUTE COUNTY—Sutter-Butte Diversion Dam No. 343. Sutter-Butte Canal Company, Gridley, owner; crib, 9 feet above streambed with a storage capacity of over 10 acre-feet. Situated on Feather River tributary to Sacramento River in Sec. 23, T. 19 N., R. 3 E., M. D. M., for diversion purposes for irrigation use.

CONTRA COSTA COUNTY—Antioch Dam No. 3. Town of Antioch, Antioch, owner; earthfill, 48 feet above streambed with a storage capacity of 520 acre-feet. Situated on an unnamed creek tributary to San Joaquin River in Sec. 36, T. 2 N., R. 1 E., M. D. M., for storage purposes for municipal use. Estimated cost \$12,500.

MADERA COUNTY—South Fork Dam No. 95-13. San Joaquin Light and Power Corporation, Fresno, owner; gravity, 20 feet above streambed with a storage capacity of 18 acre-feet. Situated on South Fork of North Fork of San Joaquin River tributary to San Joaquin River in Sec. 19, T. 8 S., R. 23 E., M. D. M., for storage purposes for power use.

FRESNO COUNTY—Bald Afterbay Dam No. 95-2. San Joaquin Light and Power Corporation, Fresno, owner; arch, 71 feet above streambed with a storage capacity of 125 acre-feet. Situated on North Fork of Kings River tributary to Kings River in Sec. 12, T. 12 S., R. 26 E., M. D. M., for storage purposes for afterbay pond use. Estimated cost, \$250,000.

MADERA COUNTY—Crane Valley Dam No. 95-3. San Joaquin Light and Power Company, Fresno, owner; earth and rock fill, 130 feet above streambed with a storage capacity of 45,000 acre-feet. Situated on North Fork of San Joaquin River tributary to San Joaquin River in Sec. 25, T. 7 S., R. 22 E., for storage purposes for power use. Estimated cost, \$1,450,000.

MADERA COUNTY—No. 1 Forebay Dam No. 95-4. San Joaquin Light and Power Corporation, Fresno, owner; earthfill, with a storage capacity of 50 acre-feet. Situated on No. 1 ditch in Sec. 7, T. 9 S., R. 23 E., M. D. M., for regulation purposes for power use.

MADERA COUNTY—No. 2 Forebay Dam No. 95-5. San Joaquin Light and Power Corporation, Fresno, owner; arch, 27 feet above streambed with a storage capacity of 11 acre-feet. Situated on No. 2 ditch in Sec. 30, T. 8 S., R. 23 E., M. D. M., for regulation purposes for power use.

MADERA COUNTY—No. 3 Forebay Dam No. 95-6. San Joaquin Light and Power Corporation, Fresno, owner; earthfill, 30 feet above streambed with a storage capacity of 20 acre-feet. Situated on ditch in Sec. 11, T. 8 S., R. 22 E., M. D. M., for regulation purposes for power use.

KERN COUNTY—Kern Canyon Diversion No. 95-7. San Joaquin Light and Power Corporation, Fresno, owner; gravity, 16 feet above streambed with a storage capacity of 27 acre-feet. Situated on Kern River in Sec. 29, T. 28 S., R. 30 E., M. D. M., for diversion purposes for power use. Estimated cost \$69,000.

FRESNO AND MADERA COUNTIES—Kerckhoff Diversion Dam No. 95-8. San Joaquin Light and Power Corporation, Fresno, owner; arch, 97 feet above streambed with a storage capacity of 4200 acre-feet. Situated on San Joaquin River in Sec. 24, T. 9 S., R. 22 E., M. D. M., for diversion purposes for power use. Estimated cost \$812,500.

MARIPOSA COUNTY—Mountain King Diversion Dam No. 95-11. San Joaquin Light and Power Corporation, Fresno, owner; gravity, 5.0 feet above streambed with a storage capacity of 14 acre-feet. Situated on Merced River tributary to San Joaquin River in Sec. 1, T. 4 S., R. 17 E., M. D. M., for diversion purposes for power use.

MADERA COUNTY—Manzanita Lake Dam No. 95-12. San Joaquin Light and Power Corporation, Fresno, owner; arch, 28 feet above streambed with a storage capacity of 200 acre-feet. Situated on North Fork of North Fork of San Joaquin River tributary to San Joaquin River in Sec. 12, T. 8 S., R. 22 E., M. D. M., for storage purposes for power use.

FRESNO COUNTY—Bald Diversion Dam No. 95. San Joaquin Light and Power Corporation, Fresno, owner; arch, 65 feet above streambed with a storage capacity of 185 acre-feet. Situated on North Fork Kings River tributary to Kings River in Sec. 3, T. 12 S., R. 27 E., for diversion purposes for power use. Estimated cost \$158,100.

SANTA BARBARA COUNTY—Gibraltar Dam No. 11. City of Santa Barbara, Santa Barbara, owner; arch, 140 feet above streambed with a storage capacity of 13,746 acre-feet. Situated on Santa Ynez River in Sec. 11, T. 5 N., R. 27 W., S. B. M., for storage and diversion purposes for municipal use. Estimated cost \$800,000.

SANTA BARBARA COUNTY—Sheffield Reservoir Dam No. 11-2. City of Santa Barbara, Santa Barbara, owner; earthfill, 15 feet above streambed with a storage capacity of 30 acre-feet. Situated on branch of Sycamore Creek for storage purposes for municipal use. Estimated cost \$60,000.

YUBA COUNTY—Lake Francis Dam No. 97-3. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 65 feet above streambed with a storage capacity of 2410 acre-feet. Situated on Dobbins Creek tributary to Yuba River in Sec. 5, T. 17 N., R. 7 E., M. D. M., for storage purposes for power use. Estimated cost \$182,950.

PLACER COUNTY—Alta Forebay Dam No. 97-10. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 9 feet high with a storage capacity of 65 acre-feet. Situated on no stream in Sec. 36, T. 16 N., R. 11 E., M. D. M., for regulating purposes for power use. Estimated cost \$4,760.

PLACER COUNTY—Bonnie Nook Dam No. 97-13. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 18½ feet high with a storage capacity of 29 acre-feet. Located in Sec. 36, T. 16 N., R. 10 E., M. D. M., for regulating purposes for irrigation use. Estimated cost \$11,693.

PLACER COUNTY—Caperton Dam No. 97-14. Pacific Gas & Electric Company, San Francisco, owner; earthfill, 17½ feet high with a storage capacity of 10.8 acre-feet. Situated on no stream in Sec. 29, T. 12 N.,

R. 7 E., M. D. M., for regulation purposes for mining and irrigation use. Estimated cost \$8,134.

PLACER COUNTY—Clover Valley Dam No. 97-16. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 7 feet above streambed with a storage capacity of 29 acre-feet. Situated on branch of Antelope Creek tributary to Sacramento River in Sec. 28, T. 12 N., R. 7 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$12,136.

NEVADA COUNTY—Deer Creek Forebay Dam No. 97-18. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 11½ feet high with a storage capacity of 26½ acre-feet. Situated on no stream in Sec. 35, T. 17 N., R. 10 E., M. D. M., for regulation purposes for power use. Estimated cost \$21,000.

NEVADA AND PLACER COUNTIES—Gold Hill Head Dam No. 97-22. Pacific Gas & Electric Company, San Francisco, owner; gravity, 25 feet above streambed. Situated on Bear River tributary to Yuba River in Sec. 2, T. 13 N., R. 8 E., M. D. M., for diversion purposes for irrigation use. Estimated cost \$16,110.

NEVADA COUNTY—Lake Sterling Dam No. 97-30. Pacific Gas & Electric Company, San Francisco, owner; rockfill, 20 feet above streambed with a storage capacity of 164½ acre-feet. Situated on Sterling Creek tributary to Fordyce Creek in Sec. 10, T. 17 N., R. 13 E., M. D. M., for storage purposes for power use. Estimated cost \$10,000.

PLACER COUNTY—Mammoth Reservoir Dam No. 97-39. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 17 feet high with a storage capacity of 115 acre-feet. Situated on no stream in Sec. 7, T. 11 N., R. 8 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$15,326.

PLACER COUNTY—Orr Creek No. 97-42. Pacific Gas & Electric Company, San Francisco, owner; rubble, 22½ feet above streambed with a storage capacity of 27½ acre-feet. Situated on Orr Creek tributary to Dry Creek in Sec. 18, T. 13 N., R. 8 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$8,442.

EL DORADO COUNTY—American River Head Dam No. 97-51. Pacific Gas & Electric Company, San Francisco, owner; crib, 25 feet above streambed. Situated on South Fork of American River tributary to Sacramento River in Sec. 24, T. 11 N., R. 11 E., M. D. M., for diversion purposes for power use. Estimated cost \$32,000.

EL DORADO COUNTY—El Dorado Forebay Dam No. 97-53. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 82 feet above streambed with a storage capacity of 400 acre-feet. Situated on Long Canyon tributary to South Fork of American River in Sec. 25, T. 11 N., R. 12 E., M. D. M., for regulation purposes for power use. Estimated cost \$719,500.

EL DORADO COUNTY—El Dorado Head Dam No. 97-54. Pacific Gas & Electric Company, San Francisco, owner; rockfill, 10 feet above streambed. Situated on South Fork of American River tributary to Sacramento River in Sec. 29, T. 11 N., R. 15 E., M. D. M., for diversion purposes for power use. Estimated cost \$36,500.

EL DORADO COUNTY—Finnon Dam No. 97-55. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 50 feet above streambed with a storage capacity of 600 acre-feet. Situated on Jay Bird Creek tributary to South Fork of American River in Sec. 16, T. 11 N., R. 11 E., M. D. M., for storage purposes for power use. Estimated cost \$113,900.

SACRAMENTO COUNTY—Folsom Dam No. 97-56. Pacific Gas & Electric Company, San Francisco, owner; gravity, 68 feet above streambed. Situated on American River tributary to Sacramento River in Sec. 24, T. 10 N., R. 7 E., M. D. M., for diversion purposes for power use. Estimated cost \$596,379.

ALPINE COUNTY—Twin Lakes Dam No. 97-59. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 7½ feet above streambed with a storage capacity of 21,250 acre-feet. Situated on branch of Silver Fork tributary to American River in Sec. 18, T. 19 N., R. 13 E., M. D. M., for storage purposes for power use. Estimated cost \$1,089,750.

AMADOR COUNTY—Bear River Dam No. 97-61. Pacific Gas & Electric Company, San Francisco, owner; rockfill, 75 feet above streambed with a storage capacity of 6712 acre-feet. Situated on Bear River tributary to North Fork of Mokelumne River in Sec. 9, T. 8 N., R. 16 E., M. D. M., for storage purposes for power use. Estimated cost \$250,000.

AMADOR COUNTY—New York Reservoir Dam No. 97-64. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 17 feet above streambed with a storage capacity of 49 acre-feet. Situated on tributary

to Jackson Creek tributary to Dry Creek in Sec. 1, T. 6 N., R. 11 E., M. D. M., for regulation purposes for domestic and irrigation use. Estimated cost \$9,063.

AMADOR COUNTY—Petty Forebay Dam No. 97-65. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 8 feet high with a storage capacity of 12.4 acre-feet. Situated on no stream in Sec. 28, T. 6 N., R. 12 E., M. D. M., for regulation purposes for power use. Estimated cost \$48,000.

AMADOR COUNTY—Tanner Reservoir Dam No. 97-68. Pacific Gas & Electric Company, San Francisco, owner; earthenfill, 7½ feet above streambed with a storage capacity of 12.3 acre-feet. Situated on no stream in Sec. 8, T. 6 N., R. 11 E., M. D. M., for regulation purposes for domestic and mining use. Estimated cost \$9,238.

TUOLUMNE COUNTY—Kincaid Reservoir Dam No. 97-72. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 15 feet above streambed with a storage capacity of 75 acre-feet. Situated on a small stream tributary to Curtis Creek in Sec. 9, T. 1 N., R. 15 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$5,613.

TUOLUMNE COUNTY—Matelot Dam No. 97-75. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 13 feet high with a storage capacity of 12 acre-feet. Situated on no stream in Sec. 1, T. 2 N., R. 14 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$6,428.

TUOLUMNE COUNTY—Montezuma Dam No. 97-76. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 9 feet high with a storage capacity of 11½ acre-feet. Situated on no stream in Sec. 30, T. 1 N., R. 14 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$3,150.

TUOLUMNE COUNTY—O'Neill Dam No. 97-77. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 5 feet high with a storage capacity of 12 acre-feet. Situated on no stream in Sec. 4, T. 1 N., R. 14 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$3,629.

TUOLUMNE COUNTY—Phoenix Dam No. 97-78. Pacific Gas & Electric Company, San Francisco, owner; earth and masonry, 30½ feet above streambed with a storage capacity of 12½ acre-feet. Situated on Sullivan Creek tributary to Woods Creek in Sec. 28, T. 2 N., R. 15 E., M. D. M., for regulation purposes for irrigation and domestic use. Estimated cost \$36,490.

TUOLUMNE COUNTY—Racetrack Reservoir No. 97-79. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 6 feet high with a storage capacity of 6 acre-feet. Situated on no stream in Sec. 26, T. 2 N., R. 14 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$825.

TUOLUMNE COUNTY—Relief Dam No. 97-80. Sierra & San Francisco Power Company, San Francisco, owner; rockfill, 130 feet above streambed with a storage capacity of 15,122 acre-feet. Situated on Relief Creek tributary to Middle Fork Stanislaus River in Sec. 13, T. 5 N., R. 20 E., M. D. M., for storage purposes for power use. Estimated cost \$850,402.

TUOLUMNE COUNTY—San Diego Reservoir No. 97-82. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 28.5 feet high with a storage capacity of 40 acre-feet. Situated on no stream in Sec. 13, T. 5 N., R. 20 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$4,980.

TUOLUMNE COUNTY—Stanislaus Forebay Dam No. 97-83. Sierra & San Francisco Power Company, San Francisco, owner; earthenfill, 54 feet high with a storage capacity of 301 acre-feet. Situated on no stream in Sec. 5, T. 3 N., R. 15 E., M. D. M., for regulation purposes for power use. Estimated cost \$114,800.

SHASTA COUNTY—Coleman Forebay Dam No. 97-87. Pacific Gas & Electric Company, San Francisco, owner; earth and rockfill, 17 feet high with a storage capacity of 73 acre-feet. Situated on no stream in Sec. 32, T. 30 N., R. 2 W., M. D. M., for regulation purposes for power use. Estimated cost \$54,874.

SHASTA COUNTY—Cow Creek Forebay Dam No. 97-88. Pacific Gas & Electric Company, San Francisco, owner; earth fill, 14 feet high with a storage capacity of 5.3 acre-feet. Situated on no stream in Sec. 32, T. 32 N., R. 1 W., M. D. M., for regulation purposes for power use. Estimated cost \$7,550.

SHASTA AND TEHAMA COUNTIES—Eagle Canyon Diversion Dam No. 97-89. Pacific Gas & Electric Company, San Francisco, owner; gravity, 11 feet above streambed. Situated on North Battle Creek tributary to Battle Creek in Sec. 25, T. 30 N., R. 1 W., M. D. M., for diversion purposes for power use. Estimated cost \$4,000.

TEHAMA COUNTY—Inskip Head Dam No. 97-90. Pacific Gas & Electric Company, San Francisco, owner; gravity, 32 feet above streambed. Situated on South Battle Creek tributary to Battle Creek in Sec. 5, T. 24 N., R. 1 E., M. D. M., for diversion purposes for power use. Estimated cost \$12,327.

SHASTA COUNTY—Kilrac Forebay Dam No. 97-91. Pacific Gas & Electric Company, San Francisco, owner; earthen, 10 feet high with a storage capacity of 30.4 acre-feet. Situated on no stream in Sec. 33, T. 33 N., R. 1 E., M. D. M., for regulation purposes for power use.

SHASTA COUNTY—Lake Grace Dam No. 97-92. Pacific Gas & Electric Company, San Francisco, owner; earthen, 12 feet high with a storage capacity of 25.1 acre-feet. Situated on no stream in Sec. 4, T. 30 N., R. 1 E., M. D. M., for regulation purposes for power use. Estimated cost \$15,136.

SHASTA COUNTY—Macumber Dam No. 97-94. Pacific Gas & Electric Company, San Francisco, owner; combination, 20 feet above streambed with a storage capacity of 1213 acre-feet. Situated on North Battle Creek tributary to Battle Creek in Sec. 15, T. 31 N., R. 2 E., M. D. M., for storage purposes for power use. Estimated cost \$28,132.

SHASTA COUNTY—North Battle Creek Reservoir Dam No. 97-96. Pacific Gas & Electric Company, owner; gravity, 52 feet above streambed with a storage capacity of 2534 acre-feet. Situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. M., for storage purposes for power use. Estimated cost \$153,115.

SHASTA COUNTY—Hat Creek No. 1 Forebay Dam No. 97-97. Mt. Shasta Power Corporation, San Francisco, owner; earthen, 12 feet above streambed with a storage capacity of 6434 acre-feet. Situated on Hat Creek Canal in Sec. 32, T. 36 N., R. 4 E., M. D. M., for regulation purposes for power use. Estimated cost \$88,052.

LAKE COUNTY—Scott Dam No. 97-101. Snow Mountain Water & Power Company, San Francisco, owner; gravity, 120 feet above streambed with a storage capacity of 73,163 acre-feet. Situated on South Eel River tributary to Eel River in Sec. 14, T. 18 N., R. 10 W., M. D. M., for storage purposes for power use.

MENDOCINO COUNTY—Van Arsdale Dam No. 97-102. Snow Mountain Water & Power Company, San Francisco, owner; earthen, 12 feet above streambed with a storage capacity of 700 acre-feet. Situated on South Eel River tributary to Eel River in Sec. 20, T. 18 N., R. 11 W., M. D. M., for storage and diversion purposes for power use.

LOS ANGELES COUNTY—Big Dalton Dam No. 32. Los Angeles County Flood Control District, Los Angeles, owner; arched gravity, 70 feet above streambed with a storage capacity of 1290 acre-feet. Situated on Big Dalton Creek tributary to Walnut Creek in Sec. 15, T. 1 N., R. 9 W., S. B. M., for storage purposes for flood control use. Estimated cost \$911,600.

LOS ANGELES COUNTY—Live Oak Dam No. 32-7. Los Angeles County Flood Control District, Los Angeles, owner; arched gravity, 10 feet above streambed with a storage capacity of 300 acre-feet. Situated on Live Oak Creek tributary to San Jose Creek in Sec. 32, T. 1 N., R. 8 W., S. B. M., for storage purposes for flood control use. Estimated cost \$173,254.

LOS ANGELES COUNTY—Puddingstone Dam No. 32-9. Los Angeles County Flood Control District, Los Angeles, owner; earthen, 135 feet above streambed with a storage capacity of 17,398 acre-feet. Situated on Walnut Creek tributary to San Gabriel River in Sec. 15, T. 1 S., R. 9 W., S. B. M., for storage purposes for flood control use. Estimated cost \$930,000.

LOS ANGELES COUNTY—San Dimas Dam No. 32-10. Los Angeles County Flood Control District, Los Angeles, owner; arched gravity, 10 feet above streambed with a storage capacity of 1810 acre-feet. Situated on San Dimas Creek tributary to Walnut Creek in Sec. 24, T. 1 N., R. 9 W., S. B. M., for storage purposes for flood control. Estimated cost \$564,620.

LOS ANGELES COUNTY—Thompson Creek Dam No. 32-15. Los Angeles County Flood Control District, Los Angeles, owner; earthen, 58 feet above streambed with a storage capacity of 877 acre-feet. Situated on Thompson Creek tributary to San Jose Creek in Sec. 27, T. 1 N., R. 8 W., S. B. M., for storage purposes for flood control use. Estimated cost \$241,645.

LOS ANGELES COUNTY—Puddingstone Diversion Dam No. 32-16. Los Angeles County Flood Control District, Los Angeles, owner; earthen, 23 feet above streambed with a storage capacity of 148 acre-feet. Situated on San Dimas Creek tributary to Walnut Creek in Sec. 36, T. 1 N., R. 9 W., S. B. M., for

diversion purposes for flood control use. Estimated cost \$185,443.28.

SAN BERNARDINO COUNTY—Lake Arrowhead Dam No. 805. Arrowhead Lake Company, Lake Arrowhead, owner; earthen, 170 feet above streambed with a storage capacity of 47,000 acre-feet. Situated on Little Bear Creek tributary to Deep Creek in Sec. 14, T. 2 N., R. 3 W., S. B. M., for storage purposes for irrigation, domestic, power and recreation use.

AMADOR COUNTY—Henderson Dam No. 1-10. Preston School of Industry, Waterman, owner; earthen, 433 feet above streambed with a storage capacity of 500 acre-feet. Situated on Mule Creek tributary to Mokelumne River in Sec. 9, T. 6 N., R. 10 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$50,000.

AMADOR COUNTY—Henderson Forebay Dam No. 1-11. Preston School of Industry, Waterman, owner; earthen, 33 feet above streambed with a storage capacity of 30 acre-feet. Situated on Sutter Creek in Sec. 18, T. 6 N., R. 10 E., M. D. M., for storage purposes for power and irrigation use.

RIVERSIDE COUNTY—El Casco Dam No. 145-7. G. O. Trauzettal, El Casco, owner; earthen, 16 feet above streambed with a storage capacity of 15 acre-feet. Located in Sec. 20, T. 2 S., R. 2 W., S. E. M., for storage purposes for irrigation use.

SANTA BARBARA COUNTY—Buell Dam No. 34. Montecito County Water District, Santa Barbara, owner; earthen, 90 feet above streambed with a storage capacity of 172 acre-feet. Situated on a small gulch tributary to Toro Canyon Creek in Sec. 11, T. 4 N., R. 26 W., S. B. M., for storage purposes for municipal use. Estimated cost \$133,950.

MENDOCINO COUNTY—Mendocino Middle Dam No. 1-3. Mendocino State Hospital, Talmage, owner; gravity and rock, 27 feet above streambed with a storage capacity of 30 acre-feet. Situated on South Mill Creek tributary to Russian River in Sec. 25, T. 15 N., for storage and diversion purposes for irrigation use. Estimated cost \$9,500.

MENDOCINO COUNTY—Mendocino Upper Dam No. 1-4. Mendocino State Hospital, Talmage, owner; gravity, 39 feet above streambed with a storage capacity of 65 acre-feet. Situated on South Mill Creek tributary to Russian River in Sec. 25, T. 15 N., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$56,400.

PLUMAS COUNTY—Bucks Diversion Dam No. 94. Feather River Power Company, San Francisco, owner; arch, 86 feet above streambed with a storage capacity of 5843 acre-feet. Situated on Bucks Creek tributary to North Fork of Feather River in Sec. 29, T. 24 N., R. 7 E., M. D. M., for diversion and storage purposes for power and irrigation use. Estimated cost \$746,079.

PLUMAS COUNTY—Bucks Storage Dam No. 94-2. Feather River Power Company, San Francisco, owner; rockfill, 109 feet above streambed with a storage capacity of 101,926 acre-feet. Situated on Bucks Creek tributary to North Fork Feather River in Sec. 33, T. 24 N., R. 7 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$2,359,492.

PLUMAS COUNTY—Grizzly Forebay Dam No. 94-3. Feather River Power Company, San Francisco, owner; arch, 79 feet above streambed with a storage capacity of 11,192 acre-feet. Situated on Grizzly Creek tributary to North Fork of Feather River in Sec. 24, T. 24 N., R. 6 E., M. D. M., for storage and diversion purposes for power and irrigation use. Estimated cost \$651,910.

PLUMAS COUNTY—Lower Three Lakes Dam No. 94-4. Feather River Power Company, San Francisco, owner; rockfill, 24.3 feet above streambed with a storage capacity of 513 acre-feet. Situated on Milk Ranch Creek tributary to North Fork of Feather River in Sec. 5, T. 24 N., R. 7 E., M. D. M., for storage purposes for power and irrigation use. Estimated cost \$86,339.

PLUMAS COUNTY—Butt Valley Dam No. 93. Great Western Power Company, San Francisco, owner; earthen, 42 feet above streambed with a storage capacity of 45,768 acre-feet. Situated on Butt Creek tributary to North Fork of Feather River in Sec. 13, T. 26 N., R. 7 E., M. D. M., for storage and diversion purposes for power and irrigation use. Estimated cost \$288,000.

BUTTE COUNTY—Intake Dam No. 93-2. Great Western Power Company, San Francisco, owner; gravity, 45 feet above streambed with a storage capacity of 600 acre-feet. Situated on North Fork of Feather River tributary to Sacramento River in Sec. 36, T. 22 N., R. 4 E., M. D. M., for diversion and storage purposes for power use. Estimated cost \$775,000.

PLUMAS COUNTY—Big Meadows Dam No. 93-3. Great Western Power Company, San Francisco, owner; earthfill. Situated on North Fork of Feather River tributary to Feather River in Sec. 28, T. 27 N., R. 8 E., M. D. M.,

LOS ANGELES COUNTY—Chatsworth No. 2 Dam No. 6-4A. City of Los Angeles, Los Angeles, owner; earthfill, 28 feet above streambed with a storage capacity of 1400 acre-feet. Situated in Chatsworth Hills tributary to Los Angeles, located in Ex Mission de San Fernando for storage purposes for municipal use. Estimated cost \$202,200.

LOS ANGELES COUNTY—Chatsworth No. 3 Dam No. 6-4C. City of Los Angeles, Los Angeles, owner; earthfill, 37 feet above streambed with a storage capacity of 7400 acre-feet. Situated in Chatsworth Hills tributary to Los Angeles River located in Ex Mission de San Fernando for storage purposes for municipal use. Estimated cost \$126,500.

YUBA COUNTY—Los Verjels Dam No. 334. Los Verjels Land & Water Company, Sacramento, owner; multiple arch, 50 feet above streambed with a storage capacity of 7500 acre-feet. Situated on Dry Creek tributary to Yuba River in Sec. 34, T. 18 N., R. 6 E., M. D. M., for storage purposes for irrigation use.

SAN FRANCISCO COUNTY—Lombard St. Reservoir Dam No. 10-5. Spring Valley Water Company, San Francisco, owner; earth embankment, 17.5 feet high with a storage capacity of 8.3 acre-feet. Situated on no stream for distribution purposes for domestic use.

RIVERSIDE COUNTY—Mocking Bird Dam No. 814. Gage Canal Company, Riverside, owner; earthfill, 60 feet above streambed with a storage capacity of 232 acre-feet. Situated on Mocking Bird canyon in Sec. 20, T. 3 S., R. 5 W., S. B. M., for storage purposes for irrigation use. Estimated cost \$100,000.

SONOMA COUNTY—Industrial Farm for Women Dam No. 1. Industrial Farm for Women, State of California, Sonoma, owner; arch, 32.5 feet above streambed with a storage capacity of 7.7 acre-feet. Situated on Johnson Creek tributary to Sonoma Creek in Sec. 4, T. 5 N., R. 5 W., M. D. M., for storage purposes for irrigation use. Estimated cost \$24,920.

SONOMA COUNTY—Fern Lake-South Dam No. 1-12A. Sonoma State Home, Ukiah, owner; earthfill, 34 feet above streambed with a storage capacity of 185 acre-feet. Situated on Hill Creek tributary to Sonoma Creek, Sec. 21, T. 6 N., R. 6 W., M. D. M., for storage purposes for irrigation and fire protection use.

EL DORADO COUNTY—American Reservoir Dam No. 462. Diamond Ridge Water Company, Diamond Springs, owner; earthfill, 22 feet above streambed with a storage capacity of 1200 acre-feet. Situated on no stream in Sec. 31, T. 10 N., R. 9 E., M. D. M., for storage purposes for stock watering use. Estimated cost \$14,500.

PLUMAS COUNTY—Quincy Log Pond Dam No. 281. Quincy Lumber Co., Inc., Quincy, owner; earthfill, 8 feet above streambed. Situated on an unnamed drainage tributary to Spanish Creek in Sec. 14, T. 24 N., R. 9 E., M. D. M., for storage purposes for logging use. Estimated cost \$7,000.

SISKIYOU COUNTY—Montague City Reservoir Dam No. 60-2. Montague Water Conservation District, Montague, owner; earthfill, 17 feet above streambed with a storage capacity of 5 acre-feet. Situated on a ravine tributary to Little Shasta River in Sec. 23, T. 5 N., R. 6 W., M. D. M., for storage purposes for municipal use. Estimated cost \$4,984.

NEVADA COUNTY—Bowman North Rockfill Dam No. 61-2A. Nevada Irrigation District, Grass Valley, owner; rockfill, 63 feet above streambed with a storage capacity of 67,000 acre-feet. Situated on Canyon Creek tributary to South Yuba River in Sec. 5, T. 13 N., R. 12 E., M. D. M., for storage purposes for irrigation and other uses. Estimated cost \$680,000.

NEVADA COUNTY—Bowman South Arch Dam No. 61-2B. Nevada Irrigation District, Grass Valley, owner; arch, 108 feet above streambed with a storage capacity of 67,000 acre-feet. Situated on Canyon Creek tributary to South Yuba River in Sec. 8, T. 13 N., R. 12 E., M. D. M., for storage purposes for irrigation and other uses. Estimated cost \$245,000.

NEVADA COUNTY—Sawmill Lake Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; rockfill, 45 feet above streambed with a storage capacity of 2000 acre-feet. Situated on Canyon Creek tributary to South Yuba River in Sec. 11, T. 18 N., R. 12 E., M. D. M., for storage purposes for irrigation and other uses.

RIVERSIDE COUNTY—Lake Hemet Dam No. 817-A. Lake Hemet Water Company, Hemet, owner; arched gravity, 135 feet above streambed with a

storage capacity of 14,000 acre-feet. Situated on South Fork tributary to San Jacinto River in Sec. 7, T. 6 S., R. 3 E., S. B. M., for storage purposes for irrigation use. Estimated cost \$213,000.

RIVERSIDE COUNTY—Little Lake Dam No. 817-2. Lake Hemet Water Company, Hemet, owner; earthfill, 14 feet above streambed with a storage capacity of 90 acre-feet. Located in Sec. 19, T. 5 S., R. 1 E., S. B. M., for storage purposes for irrigation use. Estimated cost \$3,300.

RIVERSIDE COUNTY—Lake Hemet Spillway Dam No. 811-B. Lake Hemet Water Company, Hemet, owner; arch, 14 feet above streambed with a storage capacity of 12,930 acre-feet. Situated on no stream, tributary to San Jacinto River in Sec. 7, T. 6 S., R. 3 E., S. B. M., for storage purposes for irrigation use. Estimated cost \$23,600.

SIERRA COUNTY—Upper Salmon Dam No. 294. E. A. & J. O. Hayes, San Jose, owners; rockfill, 10 feet above streambed with a storage capacity of 400 acre-feet. Situated on Salmon Lake outlet tributary to North Fork of Yuba River in Sec. 29, T. 21 N., R. 12 E., M. D. M., for storage purposes for power use.

SIERRA COUNTY—Lower Salmon Lake Dam No. 294-2. E. A. & J. O. Hayes, San Jose, owners; rock and earthfill, 12 feet above streambed with a storage capacity of 6000 acre-feet. Situated on outlet Lower Salmon Lake tributary to North Fork of Yuba River in Sec. 28, T. 21 N., R. 12 E., M. D. M., for storage purposes for power use.

NEVADA COUNTY—Deer Creek Diversion Dam No. 61-3. Nevada Irrigation District, Grass Valley, owner; 86 feet above streambed with a storage capacity of 1400 acre-feet. Situated on Deer Creek tributary to Yuba River in Sec. 10, T. 16 N., R. 9 E., M. D. M., for diversion purposes for irrigation and other uses.

NEVADA COUNTY—Faucherie Dam No. 61-5. Nevada Irrigation District, Grass Valley, owner; timber, 23 feet above streambed with a storage capacity of 2000 acre-feet. Situated on Canyon Creek tributary to South Yuba River in Sec. 13, T. 18 N., R. 12 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rockfill, 56 feet above streambed with a storage capacity of 12,500 acre-feet. Situated on Canyon Creek tributary to South Yuba River in Sec. 17, T. 18 N., R. 13 E., M. D. M., for storage purposes for irrigation and other uses.

SIERRA AND NEVADA COUNTIES—Milton Diversion Dam No. 61-7. Nevada Irrigation District, Grass Valley, owner; arch, 27 feet above streambed. Situated on Middle Fork tributary to Yuba River in Sec. 12, T. 18 N., R. 12 E., M. D. M., for diversion purposes for irrigation and other uses. Estimated cost \$26,000.

PLACER AND NEVADA COUNTIES—Van Geisen Diversion Dam No. 61-9. Nevada Irrigation District, Grass Valley, owner; arch, 75 feet above streambed with a storage capacity of 5000 acre-feet. Situated on Bear River tributary to Yuba River in Sec. 2, T. 13 N., R. 8 E., M. D. M., for diversion and storage purposes for irrigation and other uses.

SISKIYOU COUNTY—Hart Dam No. 181. E. C. and Kate C. Hart, Montague, owners; earthfill, 10 feet above streambed with a storage capacity of 100 acre-feet. Situated on Martin Creek tributary to Little Shasta Creek in Sec. 19, T. 45 N., R. 4 W., M. D. M., for storage purposes for irrigation use.

AMADOR COUNTY—Silver Lake Dam No. 97-58. Pacific Gas & Electric Company, San Francisco, owner; rock crib, 22 feet above streambed with a storage capacity of 5360 acre-feet. Situated on an unnamed stream tributary to Silver Fork of American River in Sec. 32, T. 10 N., R. 17 E., M. D. M., for storage purposes for power use. Estimated cost \$18,074.

CONTRA COSTA COUNTY—Port Costa Brick Works Dam No. 585. Port Costa Brick Works, Port Costa, owner; earthfill, 28 feet above streambed with a storage capacity of 20 acre-feet. Situated on a ravine for storage purposes for industrial use. Estimated cost \$10,000.

LOS ANGELES COUNTY—San Gabriel Diversion Dam No. 104-15. Southern California Edison Company, Los Angeles, owner. Situated on San Gabriel River in Sec. 31, T. 2 N., R. 9 W., S. B. M., for diversion purposes for power use.

SAN DIEGO COUNTY—O'Neill Dam No. 831. Rancho Santa Margarita, Inc., Oceanside, owner; earthfill, 8 feet high with a storage capacity of 1390 acre-feet. Situated on no stream tributary to Santa Margarita River in Sec. 8, T. 10 S., R. 4 W., S. B. M., for storage purposes for irrigation and domestic use.

SANTA CLARA COUNTY—Searsville Dam No. 614. Leland Stanford Jr., University, Stanford University,

owner; arched gravity, 63 feet above streambed with a storage capacity of 952 acre-feet. Situated on Corte Madera Creek tributary to Searsville Creek in Sec. 18, T. 6 S., R. 3 W., M. D. M., for storage purposes for irrigation use.

SONOMA COUNTY—Fern Lake-South Dam No. 1-13B. Sonoma State Home, Eldridge, owner; earthenfill, 20 feet above streambed with a storage capacity of 135 acre-feet. Situated on Hill Creek tributary to Sonoma Creek in Sec. 21, T. 6 N., R. 6 W., M. D. M., for storage purposes for irrigation and fire protection use.

SISKIYOU COUNTY—Taimsiea Dam No. 185. Minnie A. Taimsiea, Montague, owner; earthenfill, 4 feet above streambed for storage purposes for irrigation use. Estimated cost \$750.

NAPA COUNTY—Lake Camille Dam No. 1-5. Napa State Hospital, Imola, owner; earthenfill, 25 feet above streambed with a storage capacity of 61 acre-feet. Situated on Tulocay Creek tributary to Napa River in T. 5 N., R. 4 W., M. D. M., for storage purposes for irrigation use.

NAPA COUNTY—Lake Marie Dam No. 1-6. Napa State Hospital, Imola, owner; earthenfill, 45 feet above streambed with a storage capacity of 376 acre-feet. Situated on Tulocay Creek tributary to Napa River in Sec. 19, T. 5 N., R. 3 W., M. D. M., for storage purposes for domestic and irrigation use.

NAPA COUNTY—Napa Middle Reservoir No. 2 Dam No. 1-8. Napa State Hospital, Imola, owner; earthenfill, 20 feet high with a storage capacity of 46 acre-feet. Situated on Tulocay Creek tributary to Napa River in T. 5 N., R. 4 W., M. D. M., for storage purposes for irrigation use.

NAPA COUNTY—Fire Dam. Napa State Hospital, Imola, owner; sump with a storage capacity of 7.7 acre-feet. Situated on no stream for storage purposes for fire protection.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of February, 1930.

SANTA CLARA COUNTY—Felt Lake Dam No. 614-2. Leland Stanford Jr. University, Stanford University, owner; earthenfill, 60 feet above streambed with a storage capacity of 966 acre-feet. Situated on a small draw tributary to Los Banos Creek in Sec. 22, T. 6 S., R. 3 W., M. D. M., for storage purposes for irrigation and domestic use. Estimated cost \$78,962 after August 14, 1929. Fees paid \$789.62.

LOS ANGELES COUNTY—Chatsworth Dam No. 6-4. City of Los Angeles, Los Angeles, owner; earthenfill, with a storage capacity of 42,600 acre-feet. Situated on an unnamed water course tributary to Los Angeles River located in Ex Mission de San Fernando for storage purposes for municipal use. Estimated cost \$3,894,065. Fees paid \$8,394.06.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of February, 1930.

LOS ANGELES COUNTY—Burbank No. 4 Dam No. 4-4. City of Burbank, Burbank, owner; earthenfill. Located in Sec. 1, T. 1 N., R. 14 W., S. B. M.

VENTURA COUNTY—Dennison Dam No. 761. Dennison Ranch Co., Ojai, owner; buttress. Situated on Lion Canyon Creek tributary to San Antonio Creek and Ventura River in Sec. 9, T. 4 N., R. 22 W., S. B. M. Nature of repairs, guniting earth wing.

MARIN COUNTY—Belvedere Dam No. 33-4. Marin Municipal Water District, San Rafael, owner; earthenfill, nature of work; installing outlet pipe.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of February, 1930.

MODOC COUNTY—Everly Dam No. 125. Irving C. Everly, Davis Creek, owner; earthenfill, 10 feet above streambed with a storage capacity of 1700 acre-feet. Situated on Bean Flat tributary to Long Branch and Goose Lake in Sec. 26, T. 47 N., R. 12 E., M. D. M., for storage purposes for irrigation use. Estimated cost of enlargement \$1,500.

LOS ANGELES COUNTY—Sunset Canyon Dam No. 32-14. Los Angeles County Flood Control District, Los Angeles, owner; arch, 28 feet above streambed with a storage capacity of 9.1 acre-feet. Situated on Sunset Canyon tributary to Los Angeles River in Sec.

6, T. 1 N., R. 13 W., S. B. M., for storage purposes for debris use. Estimated cost \$22,660.

TUOLUMNE COUNTY—Moccasin Creek Dam No. 9-4. City and County of San Francisco, San Francisco, owner; rock and earthenfill, 62 feet above streambed with a storage capacity of 525 acre-feet. Situated on Moccasin Creek tributary to Tuolumne River in Sec. 34, T. 1 S., R. 15 E., M. D. M., for regulation purposes for municipal and power use. Estimated cost \$600,000.

AMADOR COUNTY—Silver Lake Dam No. 97-58. Pacific Gas & Electric Company, San Francisco, owner; crib, 30 feet above streambed with a storage capacity of 12,000 acre-feet. Situated on Silver Creek tributary to South Fork of American River in Sec. 32, T. 10 N., R. 17 E., M. D. M., for storage purposes for power use. Estimated cost \$16,000 total cost, \$8,840 after August 14, 1929.

SANTA BARBARA COUNTY—Juncal Main Dam No. 34-2A. Montecito County Water District, Santa Barbara, owner; arch, 134 feet above streambed with a storage capacity of 7000 acre-feet. Situated on Santa Ynez River in Sec. 28, T. 5 N., R. 25 W., S. B. M., for diversion and storage purposes for municipal, domestic and irrigation uses. Estimated cost \$288,862.82, total.

AMADOR AND CALAVERAS COUNTIES—Salt Springs Dam No. 97-66. Pacific Gas & Electric Company, San Francisco, owner; rockfill, 285 feet above streambed with a storage capacity of 130,000 acre-feet. Situated on North Fork tributary to Mokelumne River in Sec. 33, T. 8 N., R. 16 E., M. D. M., for storage purposes for power use. Estimated cost \$6,930,000, total.

TUOLUMNE COUNTY—Lyons Dam No. 97-73. Sierra & San Francisco Power Company, San Francisco, owner; arch, 95 feet above streambed with a storage capacity of 5500 acre-feet. Situated on South Fork tributary to Stanislaus River in Sec. 24, T. 3 N., R. 16 E., M. D. M., for storage purposes for power use. Estimated cost \$287,000, total.

MONTEREY COUNTY—Peach Tree Dam No. 641. Fort Klamath Meadows Company, Hollister, owner; earthenfill, 16 feet above streambed with a storage capacity of 16 acre-feet. Situated on Peach Tree Creek tributary to San Lorenzo River in San Lorenzo Ranch for storage purposes for domestic and irrigation use. Estimated cost \$800.

LOS ANGELES COUNTY—Wrigley Reservoir No. 2 Dam No. 778-B. Santa Catalina Island Company, Avalon, owner; earthenfill, 10 feet above streambed with a storage capacity of 70 acre-feet. Situated on Grand Canyon tributary to Pacific Ocean in Sec. 32, T. 9 S., R. 14 W., S. B. M., for storage purposes for municipal and domestic use. Estimated cost \$5,500.

LOS ANGELES COUNTY—Wrigley Reservoir No. 1 Dam No. 778-A. Santa Catalina Island Company, Avalon, owner; earthenfill, 40 feet above streambed with a storage capacity of 70 acre-feet. Situated on Grand Canyon Creek tributary to Pacific Ocean in Sec. 32, T. 9 S., R. 14 W., S. B. M., for storage purposes for municipal and domestic use. Estimated cost \$14,650.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of February, 1930.

ORANGE COUNTY—Yorba Dam No. 791. Anaheim Union Water Company, Anaheim, owner; earthenfill. Situated on no stream in Sec. 34, T. 3 N., R. 9 W., S. B. M. Nature of repairs—oiling face.

LOS ANGELES COUNTY—Burbank No. 4 Dam No. 4-4. City of Burbank, Burbank, owner; earthenfill reservoir. Located in Sec. 1, T. 1 N., R. 14 W., S. B. M.

MARIN COUNTY—Belvedere Dam No. 33-4. Marin Municipal Utility District, San Rafael, owner; earthenfill. Nature of repairs—installing new outlet pipe.

Herodotus tells of a road built 4000 B. C. It was in Egypt and reached half way across the African continent. It required 10,000 men working ten years to build a single mile of it. The stone for the Pyramids was hauled over this road.

NEVADA—Reconstruction and oiling of 54 miles of Victory Highway, 52 miles of Lincoln Highway and 21 miles of Arrowhead Trail are on the program for 1930.

STATE OF CALIFORNIA

Department of Public Works

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DIVISION OF CONTRACTS AND RIGHTS OF WAY

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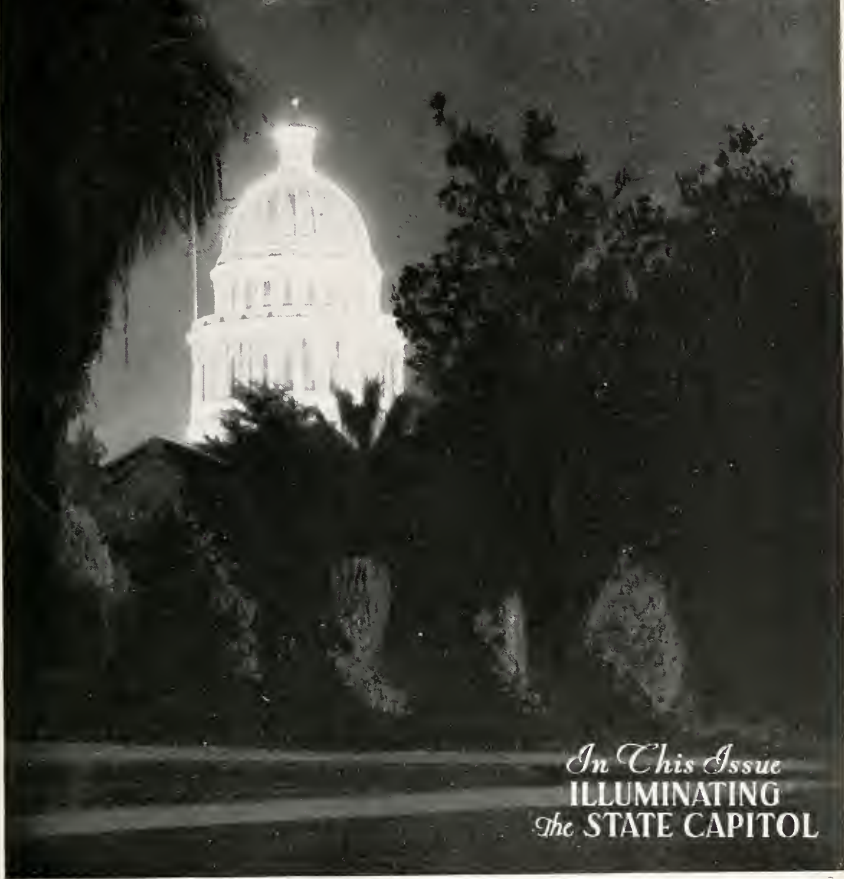
DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor
 Port of San Jose—Not appointed
 Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



In This Issue
ILLUMINATING
The STATE CAPITOL

Official Journal of the Department of Public Works
State of California

APRIL

1930

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New Designs in Highway Construction As Compared with Older Standards

By C. H. PURCELL, State Highway Engineer.

THE STANDARDS of highway location and design have, during the past three years, shown a remarkable nation-wide improvement. The engineers of the California Division of Highways are making every effort to keep their locations in line with modern practice and to insure that the service furnished will be immediate as well as permanent.

Several of the more important recent improvements in California state highway design practice are described briefly in the following paragraphs:

PERMANENT LOCATION

New roads and most major improvements of existing roads are located as nearly as can possibly be foreseen on permanent alignment and grade, which will not require future alteration or correction with consequent loss of a portion of the initial investment; and which, at the same time, is readily adapted to normal growth by widening as required by increasing traffic. In some few cases, new roads or improvements of existing roads are located and designed purposely for temporary rather than for ultimate service, but in such cases consideration is given the ultimate requirement with a view to realizing the maximum salvage value from the temporary road, when the ultimate construction is undertaken.

CURVATURE STANDARDS

Curvature on main trunk highways, in all except the most rugged country, is now usually designed to handle safely, vehicles operating at the maximum speed permitted by law. Even in the mountainous regions, 300 feet is regarded as the minimum acceptable curve radius. A properly designed curve of this radius will allow safely a speed of about 40 miles per hour. On a few secondary roads in unusually difficult country, carrying mainly recreational traffic, 200-foot radius curves are used sparingly to keep grading costs within reason.

These curvature standards present a striking contrast to the standards of a few years ago, when 100-foot radius curves were common on trunk roads and 35 miles per hour



The recently completed 30-foot Portland cement concrete pavement on a 46-foot roadbed between Ben Ali and Sylvan School in Sacramento County.

was considered maximum high speed. It may be stated without exaggeration that our primary trunk roads are being constructed or reconstructed in some cases on curvature standards which are comparable to the curvature standards of main line railroads in adjacent or similar locations.

CURVE SUPERELEVATION

Superelevation standards have been revised during the past year to accommodate higher speeds. The superelevation as applied to new projects is designed to make practically all curves within the range of Division of Highway engineering practice safe for speeds of 40 miles per hour or faster.

CURVE WIDENING

During the past year widening of all curves of 500 feet radius or shorter has been made standard practice. This provides greater clearance between cars passing on curves, increases sight distance around curves, and is so designed that the transition between un-

widened straight road and widened curves produces the effect of tapered ends to the curves, aiding greatly in the ease and comfort with which a curve is entered or left, especially at high speeds.

GRADE IMPROVEMENTS

The present tendency is toward the use of 5 per cent maximum grades, especially in the higher altitudes, in response to the popular demand for fast high gear roads. Six per cent grades are losing favor even on secondary roads, especially where the maximum grade is sustained for a considerable distance. Seven per cent grades are used only in exceptional cases, usually to avoid great loss of distance.

The old practice of rolling grades heavily to reduce cut and fill costs is practically obsolete. On all new work effort is made to secure straight, even grades as an aid to safety, visibility and appearance. In many cases, especially on side hill mountain and canyon locations, skillful engineering can secure the straight grades for no greater cost than the objectionable rolling grades.

Numerous technical refinements have been made in the detail design and coordination of grades, vertical curves, and horizontal curves, all tending toward greater safety and more pleasing appearance, usually without increased cost.

VISIBILITY ON SUMMITS

Current design requires that at summits on straight roads, objects five feet above the road surface shall be mutually visible to each other for a distance not less than 600 feet. The tendency is to increase this minimum sight distance requirement to 800 feet on important roads. Until quite recently 300 or 400 feet of sight distance was considered ample in California. This vertical sight distance is modified on curves, but is so designed as to be always greater than the horizontal sight allowed by the curve regardless of future widening.

ROADBED WIDTHS

Pavement widths of 16 feet or less are obsolete. A very few 18-foot temporary surfaces (usually gravel or crushed rock) are being constructed on certain secondary roads in mountainous country when traffic is light. A minimum 20-foot pavement width and a minimum 10-foot traffic lane width have been adopted recently for all permanent and for most temporary or stage pavements.

Shoulder width standards have increased rapidly until the 8-foot parking shoulder on each side of the surfacing is now standard practice on the average trunk road in contrast to the usual two- or three-foot shoulders of several years ago.

RIGHT OF WAY WIDTHS

Until recently most state highway rights of way were from 40 to 60 feet wide. Current California state practice, adopted within the last two years, requires a minimum right of way of 80 to 100 feet, depending on the importance and position of the road. In built up or suburban districts, definite set back lines for property improvements are usually obtained in connection with right of way agreements, to accommodate future highway growth without excessive expense due to moving buildings, etc. In National Forest lands, arrangements have been made with the Forest Service whereby leases and building permits issued for use of forest lands are restricted by set back lines at least 100 feet from the center line of state highways.

UTILIZATION OF RIGHT OF WAY

Considerable effort has been made recently to design typical standard roadway cross sections for various types of roads in order to secure a more efficient use of the right of way. For use on important roads in easy valley locations, a so-called "turnpike" section has been developed which consists essentially of a normal roadbed with wide, gentle side slopes extending to side ditches placed near the right of way lines. The side slopes are so designed that they will fit ultimate widening of the pavement, and at the same time will provide the most efficient distribution of all cut and fill material for both current and ultimate construction. Deep side borrow ditches are avoided, and the slopes are designed so that future improvement will be a continuation of the initial work rather than an alteration.

Provision for roadside trees, sidewalk space, curbs, public utilities equipment, building lines, etc., is included in the typical section designs which have been applied successfully to recent construction.

PAVEMENT CONSTRUCTION IMPROVEMENT

The last few years have seen a notable improvement in the strength, durability, and riding qualities of state highway pavements. Concrete pavements have been not only thickened but are now designed scientifically with reinforcement, variable section, etc., in a manner similar to that in which any other

Redwood Park Adorns State Highway

‘ ‘ ‘ ‘ ‘ ‘ ‘

GIANT redwoods and spectacular seacoast scenery are uniquely combined in the splendid new Del Norte Coast State Park, nearly 3000 acres in extent, and costing more than \$400,000, now preserved for the people of California and the nation by the California State Park Commission and the Save-the-Redwoods League.

Those who have traveled California's Redwood Highway where it winds above Pacific Ocean south of Crescent City, will remember this stand of giant redwoods. Its beauty is enhanced by the fact that in addition to the five miles of highway through the forest, the project includes more than seven miles of ocean frontage, the highway at times taking its course close to 1000 feet above the seacoast, with many thrilling vistas of the Pacific. This is considered one of the most spectacular drives in the world.

Officials of the California Highway Commission, the State Park Commission and the Save-the-Redwoods League are congratulating themselves upon the fact that here is one of California's outstanding scenic areas which through its status as a state park will forever be protected from defacement. No trees or undergrowth are to be destroyed; no unworthy construction or development, no "hot dog stands" or bill boards to mar the landscape picture. The beauty and tranquillity of the redwood forest, the matchless vistas of the Pacific, will in this area be kept unspoiled for all time. Not the least important feature of this park is the glorious display of rhododendrons and other wild flowers which in late May and June are at their finest.

The plan of preserving this Del Norte Coast Park, in its present confines had its nucleus in the Graves Grove, 289 acres, presented to



New State Redwood Park in Del Norte County.

the League in 1925 by Mr. George F. Schwars of New York, in honor of Colonel Henry Solon Graves, Dean of the Yale University School of Forestry and former U. S. Forester. Lands controlling highway approaches to the grove to the north and south were later acquired and presented to the League by Mr. George O. Knapp of Santa Barbara.

Other contributors toward the establishment of groves in the Del Norte Coast area include J. D. Grant of San Francisco, Madison Grant of New York, and Mrs. Samuel Boardman, Mrs. Philip Van Horne Lansdale and Mrs. Stella M. Leviston, all three of San Francisco. A sum of money toward the completion of the project was allocated from the funds in the League treasury. The state's share, derived from the sale of state park bonds, was \$199,000.

A scenic trail, two and a half miles long, from the highway down through these various "zones" to the coast, has been laid out under the direction of Mr. Emerson Knight. Other trails penetrating this forest fastness will, it is expected, be built in the future.

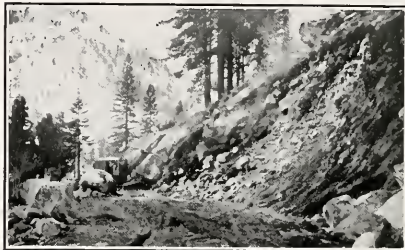
In his report, Mr. Knight says of the first three zones: "The wild, rugged character of the coast, where the sea has for ages been eating its way into the cliffs, where storms crash and waters churn about the fallen giant boulders; the deep-cut creek bottoms and the vast, silent spaces in the redwood forest, richly inhabited by rhododendrons, huckleberry, salal, ferns and lilies, render this area remarkable for park purposes, in its variety and beauty."

Of the Redwood Highway zone, Mr. Knight goes on to say: "The course of this famous thoroughfare through the park area is one of a beautiful serpentine character and about six miles in length. It ranges from about 200 feet elevation at the southern gateway to about 1000 feet, where the panorama of the coast looking northward toward the foam-fringed curve of beach from which comes the name 'Crescent City,' is suddenly encountered as a dramatic surprise, on emerging from the forest."

In referring to the scenic old county road, Mr. Knight continues: "This charming relic of earlier travel is in general quite well secluded and separated from the Redwood Highway by the first ridge parallel to the sea. While the new highway swings along the contours below the crest on the west side, the old county road lies nearer the ridge, winding mostly along the east side, protected from the wind. A considerable portion of that which

(Continued on page 21.)

TWO VIEWS OF STATE ROADS IN THE BUILDING



The contractor's equipment and force at work about one-half mile north of Eagle Falls, for the grading of a portion of state highway between Bay View Rest and one mile north of Eagle Falls, a portion of the Truckee-Meyers National Forest Highway.



Sacked concrete riprap protecting embankment of newly constructed 24-foot graded roadbed in Lake County, a portion of the Ukiah-Tahoe state highway.

ARCHITECT NAMED FOR LOS ANGELES STATE BUILDING

John C. Austin of Los Angeles has been selected as the architect of the Los Angeles State Building for the construction and furnishing of which \$1,250,000 has been provided by a bond issue. The site for the building has been accepted and preliminary sketches are now being made. As soon as these are approved working drawings will be started and completed so as to get construction under way at the earliest possible moment.

SALES TALK

Wife—The garage man says that our car must be thoroughly overhauled.

Husband (wearily)—You win. Go down and pick out your new car.

Floodlighting the State Capitol

By WALTER M. CALLAHAN, Electrical Engineer, Division of Architecture.

TO ENDEAVOR to describe the theoretical principles involved and their relation to the physical conditions which exist, in the design of a floodlighting system one would not only present an elaborate compilation of facts and figures, but would, in all



WALTER M. CALLAHAN.

probability, unduly tax the patience of the reader.

The floodlighting of the upper portion of the State Capitol Building has been in nightly operation for over a year. The comments of the general public are indeed gratifying to those of the state organization who set forth their efforts to attain the resultant effect which tends to emphasize the dignity which the building implies.

While considering this particular project, it is well for us in a general way, to turn our thoughts to the progress being made in floodlighting as regards its usefulness to industry and also its adaptation to the spectacular and aesthetic applications.

Modern floodlighting is gradually contributing a high standard of utility in the commercial field as well as a profound appreciation of the beauty and architectural design of our public buildings and civic centers.

From a utilitarian standpoint, floodlighting

has materially increased production in our industrial plants by virtue of the fact that more efficient working conditions are afforded in that an equally distributed intensity of illumination is provided. The installation of floodlights to illuminate an extremely large area permits the mounting of the units at concentrated points, quite often isolated, thereby eliminating the obstructions caused by poles or standards, which are necessary in the case of direct unit lighting. In this particular class of service we have the lighting of railroad yards, wharves and docks, building construction, grading and excavating projects, carnivals and expositions, athletic fields, airports and many other applications too numerous to mention.

DEVELOPMENT OF WORLD WAR

The development of floodlighting and its attendant equipment during the World War period was phenomenal. To successfully cope with acts of espionage, it was vitally necessary that immediate precautions be taken for the protection of industrial plants and building structures being utilized for the manufacturing of munitions or provisions for use in our national defense. This relatively new phase of production was inaugurated in an amazingly short period of time and carried on with a maximum degree of efficiency. The contribution of floodlighting in assisting this stimulated production so successfully, has been generally conceded by private and public officials engaged in this work. Since the war, this type of protection has been rapidly expanding in the continual effort to combat the vast number of the enemies of society at large.

MODERN APPLICATIONS

Penal institutions as well as insane and narcotic hospitals, are finding a solution of their lighting problems in the use of floodlights as a precautionary measure. The Division of Architecture has very recently completed the installation of an extensive floodlighting system at the State Narcotic Hospital at Spadra, California. The lighting units are arranged to thoroughly illuminate the area surrounded by a galvanized iron wire screen fence, and at the same time are so situated that no offensive glare is evident. The light-

ing units are mounted on the roofs of low buildings in such a position that their beam is directed toward the fence as well as illuminating the ground area. In the event of the prowler walking in the illuminated area or approaching the fence, a very distinct shadow is cast on the fence thereby very definitely attracting the attention of the institution attendants. An exceedingly high candlepower directional beam searchlight is mounted on top of the main building which can ascertain the moving object within the radius of three-quarters of a mile.

AIRPORTS AND AIR LANES

The most recent application and probably the greatest field open for expansion of floodlighting, is in line with the development of airports and air lanes for night flying. Commercial aviation, to be successful, is solely dependent on adequately marked routes and well illuminated landing fields.

It is logical to believe that any article or type of equipment being manufactured in the class of mass production and at the same time being constantly improved to meet the demands of exacting requirements, will quickly develop into a product of distinctive merit.

IN THE FIELD OF ARTISTRY

In addition to the foregoing described utilitarian purposes, the artistic application of floodlighting presents an unlimited field for the illuminating engineer. By a comprehensive study of the architecture, together with a correct design based on the fundamental principles of floodlighting, the conception of the architect can be lifted from nightly obscurity and portrayed on a dark and oftentimes starry background, thereby perpetuating a thought so carefully conceived.

Unfortunately, at times, the error of too brilliant or intense illumination is discernible. The shadows which tend to emphasize the mass and proportions of the structures are obliterated and at the same time, shadows which are distasteful are accentuated by the intense illumination. To attain the desired results which will idealize the original purpose, quite often necessitates a wide deviation from the so-called hard and fast rules of the technical engineer. Any attempt toward standardization of procedure in design on work of this kind, is irrational, as all structures are basically different; therefore, the success of the finished product is dependent solely upon the analytical mind of the engineer and his ability to incorporate his findings in the actual installation.

Our national, state and city governments are constantly authorizing the floodlighting of their respective civic centers. These edifices all possess architectural detail of exquisite beauty and are the manifestation of the political and community prestige. By removing them from their veil of darkness and clothing them with a robe of white light, an educational value is derived which can not be considered an unwarranted expense.

LIGHTING THE STATE CAPITOL

Keeping abreast with the national trend, the State of California included the floodlighting of the upper portion of the State Capitol in its program of construction and development.

The Division of Architecture of the State Department of Public Works completely designed the entire installation and prepared all plans and specifications governing the installation. This point is, no doubt, of particular interest for the reason that the design of floodlighting installations of major importance is in practically all instances made by engineers of lighting equipment companies specializing in this field. This project alone is indicative of a diversified field of research and development carried on by the Division of Architecture.

This particular design was rather difficult in that only three sides were available for the installation of floodlighting equipment; however, after careful study, the locating of the equipment at the correct angles enabled the engineer to obtain results which have proved satisfactory.

Main floodlighting of the dome is provided from banks of 22 General Electric Type L-24, 1000-watt projectors and 28 General Electric Type L-9, 500-watt projectors mounted on low platforms around the edge of the main roof of the Capitol.

To relieve the sharp shadows caused by the two balcony railings around the dome, a series of relief lights is employed. There are mounted on the inside of the upper balcony railing, 48 200-watt Type C lamps enclosed in Crouse-Hinds vaporproof fittings. Twenty-four of the same type of lamps and fittings are installed around the inside of the lower balcony. Not only do these lamps eliminate the shadows on the dome caused by the floodlights and railings but they also raise the railings in relief to provide a most pleasing effect.

An architectural feature of the dome is the two rows of long narrow windows separated by thin columns that surround the dome at two different elevations. A striking color

Scenic Glimpses of State Buildings

The above sketch is a view of the barracks at the Veterans Home at Yountville, California.

San Juan Grade Decision is Announced

A DECISION of the much debated question of the position of the San Juan grade in the state highway system was reached by the California Highway Commission at a meeting held on March 20th in San Francisco.

The plan as adopted by the California Highway Commission provides that the San Juan grade will be eliminated as a part of the Coast Highway but will be retained in the state highway system as a part of the Hollister lateral.

The decision of the Commission ratified a plan presented to that body by B. B. Meek, Director of the Department of Public Works. The plan was fully approved in a written opinion given by Attorney General U. S. Webb. The four salient points in the plan as voted by the California Highway Commission today are as follows:

1. Authorization to proceed at once to make the necessary surveys, plans and estimates of cost to relocate the "Coast Highway" westerly of the present San Juan grade, and make provision for starting the construction thereof in the next budget.
2. Authorization to retain and maintain the present San Juan grade as a part of the state highway system to constitute an extension of the present Hollister county seat lateral, such extension to run from San Juan Bautista over the grade to a new connection with the projected, relocated "Coast Highway" at a point south of the present grade.
3. Authorization to relinquish the short unit now in the "Coast Highway," between San Juan Bautista and the point where the new relocation would depart from the present road north of San Juan Bautista, to the county of San Benito, this unit to be maintained by the county, until such later date, as the legislature may by statutory enactment reincorporate it in the state highway system.
4. Recommendation to the next legislature that the foregoing treatment of the San Juan grade situation be recognized by appropriate legislation.

Facts relative to the San Juan grade, upon which the Commission based its decision, were cited by Director Meek as follows:

The present San Juan grade can not, within reasonable engineering possibility and within the limits of justifiable expenditure of public funds, be made to meet the traffic and safety requirements of the main north and south trunk line of the state highway. In other words, it has passed the peak of its adaptability and usefulness for such major trunk line uses.

The relocation will vastly improve grades and curves, increasing, of course, the carrying



Attorney General U. S. WEBB.

capacity of the road and adding to the safety and expedition of travel and transportation.

The highest point on the present road is 1015 feet; the highest point on the new road will be 550 feet. The length of adverse grades will be cut in half. The minimum radius curve on the present road is 100 feet; on the relocation 1000 feet. Total number of curves on the old road is 113; on the new line 38. The minimum sight distance on the present road, 75 feet; on the relocation, 600 feet.

The relocation will afford opportunity for construction at low cost of a safe, convenient road adapted to indefinite expansion as traffic requires, and capable of handling traffic safely at any reasonable speed fixed by law.

The present San Juan grade, with minor improvements and proper maintenance, in our judgment, will be suitable to be retained as a link in the Hollister county seat lateral.

Despite the heavy duty taken off the grade by the relocated unit, there will continue to be much travel on the grade, but an amount within its capacity.

The present grade will doubtless continue to serve a large share of travel to the old mission town of San Juan Bautista, Hollister and the Pacheco Pass cut-off, but should be sufficient to handle that for an indefinite period of time.

In brief, the San Juan grade with all the present commercial and tourist travel thereon,

State of California

Legal Department

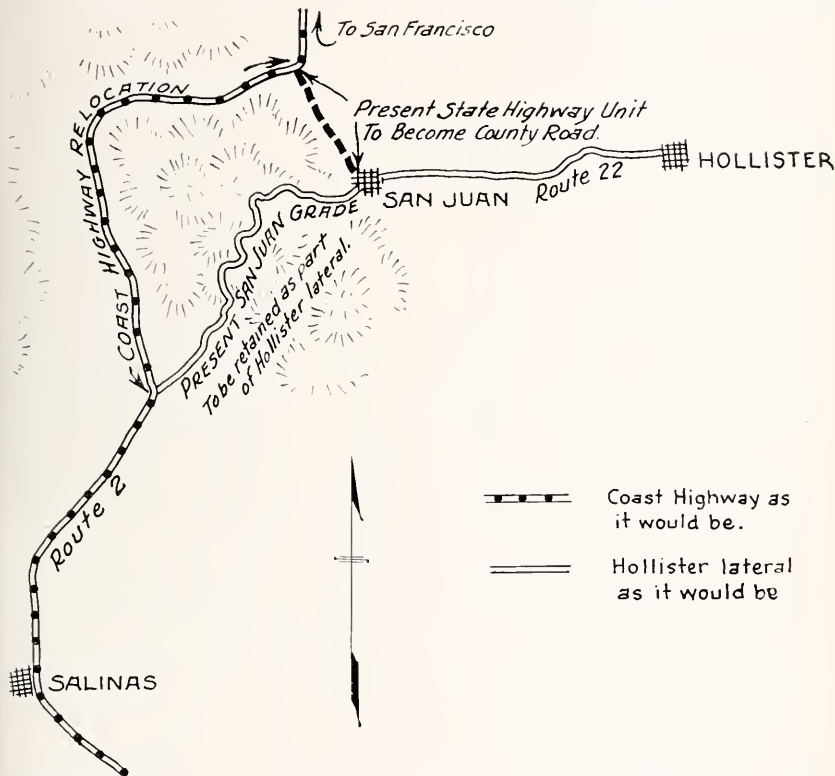
U. S. Webb,
Attorney General.

San Francisco, March 19, 1930.

Hon. B. B. Meek,
Director, Department of Public Works,
Sacramento, California.

Dear Sir:

On March 14, 1930, you addressed this office on the subject of "Relocation of Coast Highway at San Juan Grade." As stated by you this proposed relocation has been the subject of a number of conferences



is now overstressed to the danger point, but, with the abnormal traffic taken from it by the alternate route, it should, with minor improvements and maintenance, suffice for the lighter traffic.

OPINION OF ATTORNEY GENERAL

The opinion of Attorney General U. S. Webb on this subject is as follows:

between this office and "members of the California Highway Commission, Mr. C. H. Purcell, State Highway Engineer, Mr. C. C. Carleton, Chief of our Division of Contracts and Rights of Way, and the writer."

It is true that I have been made familiar with the proposed changes in routing through these various discussions and through, as you state, "inspection and examination of maps, reports of the Commission's engineers, and a report on legal aspects of the situation submitted by Mr. Carleton," all of which were furnished me some months ago and were examined

(Continued on page 26.)

Run-off Predictions Are Made Based On Data Obtained from Snow Surveys

IN THE period from late March to early April snow surveys have been completed at practically all of the 150 snow courses throughout the major stream basins of the Sierra. This constitutes the main survey as in general, this is the period when normally the major storms have occurred and melting of the snow has barely commenced. The survey data at this time therefore may be taken as indicative of the April-July run-off with later modification of estimates in accordance with subsequent storms, temperature and conditions.

The results may be summarized as follows:

For the western slope of the Sierra the data up to April 1st from the precipitation station shows an approximately uniform decrease in the precipitation expressed in percentage of normal, from 90 to 100 per cent for the upper Sacramento and Feather basins in the north to little better than 60 per cent for the upper San Joaquin, Kings and Kern basins in the south. Because the greater number of snow courses are newly established few normals are available to permit percentages of normal water content being given.

Where the survey records are of sufficient length that forecasts have been possible the average water content of the snow in per cent of normal is as follows: South Yuba River areas, 70 per cent; Tahoe basin, 60 per cent; Truckee basin, exclusive of Tahoe, 60 per cent; Carson basin, 59 per cent; West Walker basin, 60 per cent; and East Walker basin, 58 per cent. The estimates for the eastern slope basins have been made by the Forecast Committee of the Nevada Cooperative Surveys through the cooperation between California and Nevada.

Although the measurement of such snow as occurs in the higher ranges of southern California basins would probably not furnish as reliable data for water supply forecasts as in the Sierra the measurement of total precipitation, including snowfall, at representative stations in the higher areas should give data upon which forecasts of value might be based. It is planned that the surveys are to include these southern basins and the data for precipitation stations now existent (very few for the

higher areas) and to be established will be published in bulletins. For the present season a general estimate of the precipitation to April 1st in per cent of normal as given by the Los Angeles office of the U. S. Weather Bureau for the Santa Ana, San Gabriel and Los Angeles River basins is 74 per cent. At Mt. Wilson, the only weather bureau station in the high mountain area of these basins, the precipitation to April 1st in per cent of normal is reported as 58 per cent.

Based upon past experience the precipitation, October to March, inclusive, in Sacramento and San Joaquin basins would indicate seasonal run-off (October-September) in per cent of normal as follows:

Sacramento River at Red Bluff.....	74 per cent
Sacramento River at Sacramento.....	73 per cent
San Joaquin River near Vernalis.....	48 per cent
Combined Sacramento and San Joaquin flow to the Delta.....	69 per cent

With these seasonal run-off percentages minimum river flows to be expected are 3300 second-feet at Red Bluff, 2000 second-feet at Colusa, 2500 second-feet at Sacramento and minimum combined Sacramento and San Joaquin flow to the delta, 3300 second-feet. These estimates assume a rice area approximately 130 per cent of that of 1929 (preliminary estimates).

With percentages and minimum flows as given, past experience would indicate corresponding maximum salinity in the late summer at points in the delta as follows: (Parts of chlorine per 100,000) O. & A. Ferry 650, Collinsville 500, Antioch 400, Emmaton 150, Jersey 125, Rio Vista 40 and Central Landing 10.

OTHER FORECASTS

The following forecasts are made for those few basins or partial basin areas where the snow surveys have been conducted according to the standard methods adopted for a sufficient number of years to make it possible to forecast.

YUBA RIVER BASIN

Area tributary to South Fork at Laags Crossing (Lake Spaulding):

Normal water content for area (using snow survey data weighted accord-

ing to elevation from Lake Spaulding, Cisco, Furnace Flat, Lake Fordyce, Soda Springs, Meadow Lake, Red Mountain, Sawmill Flat, Lake Sterling, Summit and Webber Peak snow courses) -----	41.98 inches
1930 Mean water content for area (weighted) -----	28.98 inches
1930 Mean water content in per cent of normal -----	69.03 per cent
Normal April-July natural run-off of South Fork at Langs Crossing -----	251,000 acre-feet
Estimated 1930 April-July natural run-off 251,000 x .6903 -----	173,000 acre-feet

Area tributary to Bowman Lake:	
Normal water content for area (using snow survey data weighted according to elevation from Bowman Lake, Findley Peak, English Mountain, Meadow Lake and Webber Peak snow courses) -----	35.32 inches
1930 Mean water content for area (weighted) -----	25.56 inches
1930 Mean water content in per cent of normal -----	72.37 per cent
Normal April-July run-off for combined Jackson and Canyon creeks and Middle Yuba at Milton (above Milton-Bowman Tunnel diversion) -----	107,000 acre-feet
Estimated 1930 April-July run-off 107,000 x .7237 -----	77,500 acre-feet
Normal April-July run-off for Jackson and Canyon creeks -----	45,600 acre-feet
Estimated April-July run-off for these two creeks 45,600 x .7237 -----	33,000 acre-feet

TRUCKEE RIVER BASIN (Exclusive of Tahoe)

Weighted per cent of normal for 1930 snow surveys in zones above and below 7000 feet with weight of two for west portion of watershed and one for east portion -----	59.5 per cent
Normal April-July run-off of Truckee River at Iceland (exclusive of Tahoe) -----	325,745 acre-feet
Estimated 1930 April-July run-off:	
Probable—175,000 acre-feet or 53.7 per cent of normal.	
Possible minimum—160,000 acre-feet or 49.1 per cent of normal.	

TAHOE BASIN

Weighted per cent of normal for 1930 snow surveys in same manner as for Truckee Basin exclusive of Tahoe -----	59.5 per cent
Normal net or actual April-July rise of Lake Tahoe assuming outlet gates closed -----	1.68 feet
Estimated 1930 April-July rise 1.68 x .595 -----	1.00 feet
Elevation of lake April first -----	6223.68 feet
1930 probable maximum elevation -----	6224.70 feet
1930 possible maximum elevation in case of very deficient April-July rainfall -----	6224.50 feet

CARSON BASIN

Weighted per cent of normal for 1930 snow surveys using zones above and below 7000 feet and considering only the area tributary to West

Carson at Woodfords, to East Carson at Hangman's bridge and to Markleeville Creek at Markleeville -----	59.0 per cent
Normal April-July run-off of Carson River at Clifton -----	230,100 acre-feet
Estimated 1930 April-July run-off:	
Probable—110,000 acre-feet or 47.8 per cent of normal.	
Possible minimum—95,000 acre-feet or 41.2 per cent of normal.	

WALKER BASIN

West Walker:	
Weighted per cent of normal for 1930 snow surveys by zones -----	60.0 per cent
Normal April-July run-off of West Walker at Coleville -----	191,180 acre-feet
Estimated 1930 April-July run-off:	
Probable—101,000 acre-feet or 52.6 per cent of normal.	
Possible minimum—95,000 acre-feet or 49.6 per cent normal.	
East Walker:	
Weighted per cent of normal for 1930 snow surveys -----	58.5 per cent
Normal April-July run-off of East Walker at Bridgeport Dam -----	70,380 acre-feet
Estimated 1930 April-July run-off:	
Probable—41,000 acre-feet or 44.1 per cent of normal.	
Possible minimum—25,000 acre-feet or 35.5 per cent of normal.	

It should be noted in the foregoing that the forecasts for the basins on the eastern Sierra slope have been compiled by the Nevada Forecast Committee through the cooperation between California and Nevada. In those eastern slope basins the Nevada Cooperative Snow Surveys have been in progress for many years.

THERE'S NO ESCAPE

Lean men and clean men,
Wild men and mild men,
Wee men and be-men,
Numb men and dumb men,
Tailor men and sailor men,
Pinch hitters, steam fitters,
Golf players, man slayers,
Jobbers and robbers
Get married,
Tall girls and small girls,
Big girls and trig girls,
Neat girls and sweet girls,
Cash girls and rash girls,
Bad girls and sad girls,
Circus riders, home abiders,
Opera singers, hash slingers,
Crooks and cooks

Marry them.—*London Opinion.*

Milk produced on American farms in 1928 weighed 60 million tons—twice the weight of all the pig iron produced in the country in the same period.

A news story tells of a nonstop auto driver collapsing at the wheel of his car, after driving 201 hours.

Our hearty sympathy goes out to the driver—we, too, have tried to find a place to park!

The Historic Old
"Plank" Road



Teaching Respect to
State Property



File Mining Claims
For Road Purposes

Clippings, Letters and Comment



Dealing With State Highways

Move Creek to Make
Way for Road



Monster Steel in
Underpass Crossing



Highway Facts of
Interest

Plea To Preserve "Old Plank Road."

The following is from the Calexico *Chronicle*:

A plea for the preservation of the old plank road—or what remains of it—which spanned the rolling sand dunes east of Imperial Valley before the paving was installed, is made in a recent issue of the *Arizona Sentinel*.

The *Sentinel* writer recalls some of the obstacles which confronted the state engineers when they undertook to replace the planking with cement. One group of experts declared that if the grade was low the blow sand would cover the highway. Another group insisted that if the road was high the wind would blow the sand from under it.

The State Highway Department solved the problem by placing an engineer on the location for a period of observation. The present highway is the result—and its success has vindicated the judgment of those who made the final decision.

Here is the *Sentinel* writer's comment:

"The old plank road, which for years was the only highway crossing the sand hills, connecting Yuma with Imperial Valley, is being carted away by vandals. Since the coming of the hard surfaced pavement, the old plank road has not been used; neither has it been forgotten.

"Stretched for miles paralleling the highway it is always an interesting sight, not only to the tourists, but to those who have made the tedious trip across its many boards, bound together with iron strips. It is true that the planks are buried in many places, but the manner in which they yet shift with the sands and withstand the ravages of time and elements cause one to marvel at the ingenuity of the men responsible for the building of such a highway."

At the time the old plank was built, years ago, it was thought impossible to construct a hard surfaced road over the sand hills. In later years engineers conceived the plan of hard surfacing and then oiling the sides of the road to keep the sand from shifting. It has proven a huge success and has been acclaimed one of the greatest engineering feats of the age.

Nevertheless, we do not believe that the old plank road should be torn apart and carted away. If we have been informed correctly the road was built by public subscription and really belongs to those who contributed to the fund. No one should have the right to the boards and we sincerely trust that the California State Highway Department will see fit to stop further removal of the old road.

The name of the "old plank road" is famous throughout the country. Tourists come this way just to see how we traveled across the sand hills years ago. It is really an interesting sight and should be left just where it is, or until the sands cover it over. It is not in the way and is on no ones property. Let's try and stop further despoilation of one of the southwest's most famous and interesting marks.

* * * * *

Destruction Of State Property Punished.

A group of Fresno boys have learned that state property, including highway appurtenances, can not be destroyed with impunity.

Recently, three of the light fixtures on the bridge across the San Joaquin River at Herndon on the Fresno-Madera County line on route 4, were found to be broken. These lights in addition to being ornamental are very definitely considered as safety devices. By cooperation of District Attorney DeVore of Fresno, and of Captain W. L. McCarthy of the Highway Patrol, the boys who were guilty of breaking the lights, were apprehended and their legal guardians were advised that owing to the youth of the miscreants he would not prosecute if the damage done was fully repaired. This was done at a cost of \$33.26 covering the replacement of three lamp units.

* * * * *

Mining Claim For Road Purposes.

The following article is clipped from the *Stockton Record*:

Division Engineer R. E. Pierce of the Highway Commission is a mine owner in Calaveras County He filed a claim on a prospect near Avers, which he had located the previous week.

The new property is known as the Mountain Misery Quartz Mine, and is near the Big Trees, within easy reach of the highway. The Mountain Misery is the first claim to be located in the Avers section in several years.

Pierce located the claim for the State of California and state money will be used to develop it, which puts California in the mining business. Coincidentally, it was located for the granite deposit which it contains and not for the gold content of the rock. The granite will be crushed and used to resurface the Murphys-Big Trees Road. The ledge was on government land and open to location. It afforded the easiest way to secure a large deposit of rock for the state.

* * * * *

Creek Moved To Make Room For Highway.

This from the San Jose *Mercury Herald*:

The State Highway Department has changed the course of one of Santa Clara Valley's creeks by half a mile, the supervisors were informed by the California Department of Public Works yesterday.

Calabasas Creek, which formerly ran beside the state highway for a considerable distance between Santa Clara and Sunnyvale along that stretch once protected by a white fence, has been moved a distance of half a mile from the road to join Campbell Creek.

The new ditch, four feet wide at the bottom, 12 at the top and three feet deep, was dug by crews under N. M. Ball, who won the contract with a bid of \$6,975 a year ago.

The old channel of the creek has been filled in and is now being used for the base of the widened state highway just north of Santa Clara.

* * * * *

Monster Steel Piece In Underpass Crossing.

The San Bernardino *Sun* publishes the following article:

With the setting in place of a 101-ton steel girder, one of the largest single pieces of steel used in any railway bridge in America, the underpass being constructed jointly by the Union Pacific Railway and the State Highway Commission at Wineville is nearing completion.

The project, which will eliminate a grade crossing on the highway between Riverside and Ontario, will cost more than \$100,000 and includes the building of a quarter of a mile of new highway under the rail crossing.

The girder used in the construction of the railway over the highway was transported from Gary, Ind., on three flatcars.

Measuring 112 feet, 6 inches, in length, and 12 feet high, the girder is also one of the longest in the country. It is the main support of the railroad overhead crossing and eliminates the grade crossing at this point. When it arrived on its "tri-flatcar special" two giant cranes were hooked to it and steel workers, under the supervision of R. L. Adamson, chief engineer of the Union Pacific, had a virtual picnic placing it in position.

The Highway Commission and Pacific Electric Railway will construct an \$80,000 underpass at the point where the interurban line crosses the Foothill boulevard at Muscat. Work on this project will begin next week.

THE PUN OF THE MONTH

First Garage Mechanic—A Mr. Beard from Calaveras County was in a few minutes ago.

Second Garage Mechanic—An old timer?

First Garage Mechanic—No, a new carburetor.

HIGHWAY FACTS

From the 1929 Highways Handbook

New Jersey established the first State Highway Department in 1891.

New York State was the first to license motor vehicles, beginning in 1901, and collecting \$954 that year.

There are 6,579,826 miles of highways in the world, of which 3,000,000 are in the United States. This compares with 764,238 miles of steam railways in the world.

Governmental studies indicate that it costs an average automobile approximately 2.06 cents more per mile to drive on an earth road than on a hard-surfaced road.

The first important road in the United States was the old York Road between New York and Philadelphia, established by the colonies in 1711. The first company incorporated to build and operate a toll road was the Philadelphia and Lancaster Turnpike Company. It was incorporated in Pennsylvania in 1792 and had a road from Philadelphia to Lancaster, a distance of 62 miles. This was later taken over by the state in the public interest.

Federal road building for other than military purposes began with the "National Pike" or "Cumberland Road," said to have been the original conception of General Washington. On March 28, 1806, President Jefferson signed the bill appropriating \$30,000 for a preliminary survey, and actual work was begun not long after.

The predecessor of the present U. S. Bureau of Public Roads was the Office of Road Inquiry, established in the Department of Agriculture by the Act of March 3, 1893. The name was changed to Office of Public Roads in 1901.

The first Federal Aid Road Act as now administered was passed in 1916, carrying an appropriation of \$75,000,000 to be expended in five years.

Prior to the building of the railroads, freight was moved by road in conestoga wagons. In 1819 one of these regular services dispatched two conestoga wagons daily from Philadelphia to Pittsburgh, making the trip in 12 days and charging \$120 a ton.

There are approximately 20,000 grade crossings on the entire Federal Aid Highway system of 187,753 miles as of December 31, 1928. On the 76,000 miles of the system improved with Federal Aid from 1916 to 1928, nearly 4300 have been eliminated.

Approximately 627,000 miles, or more than one-fifth of the 3,000,000 miles of highways in the United States, are surfaced in varying degree.

Annual expenditures for rural highway construction and maintenance amount to about \$1,500,000,000. Another \$500,000,000 is spent by the cities for street facilities.

More than 50,000 miles of new highways are built annually.

Automobile drivers today average more than 2 per car; in other words, there are twice as many drivers as cars.

The longest paved motor road in the world is said to be U. S. Route 40, from Wilmington, Delaware, to St. Mary's, Kansas, a distance of 1254 miles.

The highest motor road in the United States is on Pike's Peak in Colorado, 14,109 feet above sea level.

The shortest and narrowest paved motor road in existence is believed to be the road on Smith's Island, one of the little islands in the lower Chesapeake Bay near Crisfield, Maryland. It is less than a mile long and just wide enough to permit the passage of one motor car at a time.

It's All in the Life of a Traffic Officer

EPISODES FROM OFFICIAL REPORTS OF CALIFORNIA HIGHWAY PATROL

INSPECTOR M. F. BROWN reports that he met L. M. Epps, wife and child of Tacoma, Washington, stalled on the Redwood Highway near Garberville. Epps was having gas line trouble and had lost all of his gasoline. The Inspector repaired the trouble, gave him two gallons of gasoline from his own tank and sent him to Garberville where permanent repairs on the car were made. Mr. Epps writes to the Department thanking it for the attention given him by Inspector Brown.

SERVICE ON "DAY OFF"

C. E. Burrows of Los Angeles writes as follows: "Occasionally things occur that compel a man to speak up. Because this has happened to me I am taking this opportunity of advising you that Captain J. E. Payton of the Division of Motor Vehicles at Santa Cruz, gave the writer and one of his employees considerable service on the captain's day off. This service was given in such a gentlemanly and wholehearted manner that I believe that you should be advised of the occurrence."

STOPPED CONTRABAND CHINESE

The following letter is from Walter E. Carr, District Director, Immigration Service, U. S. Department of Labor, with headquarters at Los Angeles: "On February 26th near Santa Barbara your highway patrol officer, Mr. Johnson, apprehended a Chrysler automobile in which two white men were smuggling four contraband Chinese aliens into the interior of the United States. Your patrol, through Patrol Officer Johnson, greatly assisted this service and its border patrol in this case, and we desire at this time to extend to you our heartiest thanks for this cooperation."

AUTOIST AT FAULT: SAYS SO

Paul F. Byrne of Palo Alto writes as follows: "I should like to express my sincere appreciation for the courtesy and efficiency of one of your highway patrolmen. Although I was entirely at fault the gentlemanly conduct of this officer in performing his duty should not be overlooked. To the best of my memory his number was 92. Service of this type is

appreciated by the public and will no doubt lead to safer traffic conditions." (Badge No. 92 is assigned to Patrolman H. Zierdt of Calaveras County).

HELPED '49 CELEBRATION

E. R. Gardner writes from Marysville as follows: "I wish to compliment you on the splendid service rendered the Trails of '49 Committee during our celebration in Marysville and Yuba City by your traffic officers. The committee on motion pictures in particular are desirous of commending to you the work of officers Brown, Lanme, Marvin, Curson, Bissett, Babb, White, Boatsman and Norwood under the direction of Inspector F. S. Quinn. The courteous cooperation extended our committee by each of these officers greatly facilitated the motion picture work and we wish you to know it is appreciated."

BAYSHORE HIGHWAY NOT RACE TRACK

A. J. Scampini of San Francisco addressed the following letter to the Division of Motor Vehicles: "The other day the writer was, without knowing it, proceeding at a good rate of speed when Officer Perussina overtook him and in a very gentlemanly, but firm manner, warned him that the Bayshore Highway was not intended for a race track and to be more careful of his speed. I wish to commend the officer both for his courtesy and his efficiency."

GAVE CLUE TO ROBBERY

Ivan D. Christie, border checker at Clam Beach Checking Station, Arcata, is commended for furnishing information to the sheriff's office through which it was possible for the sheriff to arrest a felon within 36 hours after a robbery was committed.

AIDED IN CAPTURING BANK ROBBERS

A. S. McCurdy, undersheriff of Marin County, writes as follows: "We wish to thank you for the excellent support that was given this office recently by your officers in the apprehension of the criminals that held up the Fairfax branch of the Bank of Italy."

For obvious reasons the signature to the following letter is omitted.

No doubt you are in receipt of many complaints from time to time, from people who feel that they have a grievance against the men who work under you. I find this true in my work and also find that the average person will not go out of their way, to say a word of praise.

It may be an unusual procedure for me to thank an officer of the law for causing my arrest but such is the purpose of this letter. Last Sunday, I took a friend of mine for an automobile ride to Tia Juana. We arrived quite early in the morning. Our primary object being, to see the races. I don't know how much whiskey, etc., that I consumed but I missed the races. I had all the confidence in the world that I was able to drive, so started to cross the line for the American side. We were stopped by Officer Harold Waite. Mr. Waite gave me every opportunity to prove to him that I was capable of driving, before he took the car from me, put me on a San Diego stage, with a ticket charging me with being drunk. At no time was there any rough talk or actions. I was shown nothing but kindness, courtesy and fairness. More perhaps than I might have shown, had our positions been changed. Mr. Waite did me a favor and perhaps saved me from serious bodily injury or injury to others. I desire that you thank him for me. I consider him a friend and hope to meet him again under different circumstances. Men of the type of Mr. Waite are a credit to the work they do and I believe should be told that they are appreciated by a few who like myself, slip back once in awhile. I feel since coming in contact with him that I have better protection while driving and I am sure that you will want him to know these things. Let him know that although his job may be an unpleasant one at times, he is doing good and making the world a better place to live in. Let me again say that I appreciate the service, you and your men are giving to the State of California

Highway Patrol Wins Editorial Praise.

The following editorial is from the *Chico Record*:

The address of H. R. Youngblood, assistant chief of the California Highway Patrol, delivered before the Rotary Club Tuesday, was highly expressive of the changed attitude relative to the enforcement of traffic regulations.

Somehow it has always seemed that only the most hard-boiled were considered as officers for enforcement of the traffic regulations. In the minds of the general public discourtesy and rough language were synonymous with traffic police. "As tough as a motor cop" was a popular comparison.

Of course there always have been exceptions. There always have been discreet, intelligent, courteous motor or traffic police. But usually they were so mixed with the majority of the opposite kind as to lose recognition.

Mr. Youngblood in explaining the operation of the new set-up in traffic regulation—in motor control—stressed the fact that discourtesy was no longer considered by its executive officers as a necessary component of efficiency.

The efforts of the department under whose authority the motor control operates to build up a personnel of intelligence, courtesy and tact, is sound, and will meet with the approval of the public.

States to Spend More For Highways in 1930

COOPERATING with President Hoover in his plea to enlarge all construction programs as much as is practicable to ameliorate the unemployment situation, the states and their counties will spend in their road building program for 1930 at least \$250,000,000 more than they spent in 1929.

Reports received from state highway departments and compiled by the Bureau of Public Roads, U. S. Department of Agriculture, show that state and local authorities plan to spend \$1,601,167,455 for highway improvement in 1930.

The planned expenditure by state highway departments for construction and maintenance of state highways is \$937,500,455; the balance, \$663,667,000, will be spent, according to the estimates, on local roads and bridges. The state highway officials of 45 states estimate the total length of roads to be improved by them in 1930 as 32,532 miles, an increase of 3126 miles over the estimate in the 1929 programs. Three states failed to report contemplated mileages for 1930.

The highway departments of all states will control the maintenance of 281,393 miles of highways this year, an increase of 32,381 over the mileage under state maintenance in 1929. Gradually, the states are taking over into their systems for maintenance the more important county and local roads of the country.

The states of greatest population and industrialization in which unemployment, naturally, is greatest, show the highest contemplated expenditures. The Middle Atlantic states, comprising New York, New Jersey and Pennsylvania, plan to spend \$374,835,310 on improvement of state and local roads; the east north central states of Ohio, Indiana, Illinois, Michigan and Wisconsin plan to spend \$303,696,000.

The west north central states, including Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas rank third in their contemplated expenditure of \$236,461,727, and the south Atlantic states of Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida, with an expenditure of \$182,872,418 rank fourth; the west south central states of Arkansas, Louisiana, Oklahoma and Texas rank fifth with an expenditure of \$154,100,000; and the Pacific states comprising Washington, Oregon and California rank sixth with an expenditure of \$121,590,000.

Hoover-Young
Water Resources
Commission Meets

Progress In Water
Resources Investi-
gation

Review of March Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Activities Among
Irrigation Dis-
tricts

Flood Control

Snow Surveys

Dam Inspections

HOOVER-YOUNG WATER RESOURCES COMMISSION

The third meeting of the joint Hoover-Young Water Commission convened at the Hotel Oakland in Oakland, March 11th.

The State Engineer announced the appointment of Professors Frank Adams and David Weeks, University of California, College of Agriculture, by the Division of Water Resources to conduct a survey of land values in the San Joaquin Valley to determine the amount of financing farm lands can absorb in the proposed water diversion to the San Joaquin Valley. These reports are to be prepared and submitted to the Hoover-Young Commission.

Lt. Col. Thos. M. Robins, federal member of the joint commission, announced the detail of men to work on the salt water barrier project investigation to ascertain the probable effect of the barrier construction on navigation, flood control and silting.

Assemblyman Bradford S. Crittenden, chairman of the State Legislative Committee read a report on the activities of that body of the last three years. A number of requests from various interests were received and filed for future consideration before the Commission.

The State Engineer informed the members of the Commission present of the results of his meeting with Dr. Elwood Mead, Chief of the U. S. Reclamation Service, in Denver. Dr. Mead conveyed his assurance to the Commission that the U. S. Reclamation Service would place every facility at its disposal to cooperate with the state and federal agencies to assist California in formulating a water conservation program along economic and sound engineering lines. Mr. Walker R. Young and Mr. C. A. Bissell of the U. S. Reclamation Service have been assigned to the work on the water resources investigation by Dr. Mead and are already at work, having arrived in Sacramento on March 20th.

The following persons were present at the meeting:

United States Members:

Lieutenant Colonel Thos. M. Robins,
E. W. Kramer, Representing F. E. Bonner,
R. J. Coffey, Representing Elwood Mead.

Ex officio:

Wm. J. Carr,
B. B. Meek.

State Members:

B. A. Etcheverry,
Wm. Durbrow,
Alfred Harrell,
W. B. Mathews,
Warren Olney,

Edward Hyatt, Secretary of the Commission,
Absent—Frank E. Weymouth.

Legislative Water Committee:

Assemblyman B. S. Crittenden,
Assemblyman Robert P. Easley,
Senator H. C. Nelson,
Senator Ralph Swing,
Assemblyman Van Bernard,
Absent—Frank W. Mixer.

WATER RESOURCES STUDY

SAN JOAQUIN VALLEY INVESTIGATION

Main Supply Canal Surveys—Surveys of canal line from mouth of canyon on the Kern River to serve areas south and east of Bakersfield were initiated and completed during the past month.

Land Classification and Crop Survey—The land classification maps and reports were submitted to the San Joaquin Valley Water Committee on February 14th for review and were returned to this office on March 14th. Only minor changes and comments were made on the land classification by the counties interested. The classification as submitted was substantially agreed to by the committee.

Ground Water Studies—Analysis of ground water data has been continued throughout the month.

Water Supply and Yield Studies—Reservoir studies on the San Joaquin River in connection with supply canal from San Joaquin to Kern River have been continued for different combinations of canal capacities and reservoir capacities for the purpose of determining the most economical combination.

Seepage Investigation—A field study has been initiated along the lower San Joaquin River for the purpose of determining, if possible, the seepage which might result when and if a pumping system were installed and operated.

SACRAMENTO VALLEY INVESTIGATION

Water Supply—Estimates of monthly run-off of the five main stream systems of the Sacramento Basin, Sacramento, Feather, Yuba, Bear and American rivers, as would be impaired by ultimate upstream use and available at the edge of the valley floor, is practically completed.

Land Classification—Crop Survey—6,200,000 acres of land in the Sacramento Valley and adjacent foothills have been classified and the crops thereon ascertained. The areas of lands and crops have been tabulated by counties, irrigation districts and reclamation districts. All this information has been submitted to the U. S. Engineers.

Engineering Advisory Committee—Field trip was made on March 4-7 inclusive, by the Engineering Advisory Committee on the Sacramento Valley Investigation, consisting of Messrs. Etcheverry, Galloway, Herrmann, Huber, Tibbetts and Dr. Londerback of the University of California. The State Engineer and A. D. Edmonston, G. W. Hawley, T. B. Waddell and Chester Marliave of the water resources staff accompanied the Advisory Committee on this trip. The Fairview dam site on the Trinity River was viewed together with the conduit line and power layouts extending from the Trinity River to the Sacramento River above Redding. Kennett dam site and the Iron Canyon dam site on the Sacramento River were also examined and examination of the core borings of the Iron Canyon dam site stored at Orland was made. Classifications of lands from Sacramento to Red Bluff were checked.

A trip of engineers and representatives of the federal departments cooperating with the Division of Water Resources in investigating the state-wide plan was made during the period March 20-22 inclusive, under the guidance of the State Engineer, for the purpose of viewing the watersheds and reservoir sites on the American, Feather, Yuba and Bear rivers. The personnel of this trip was as follows:

Colonel T. M. Robins, representing U. S. War Department.

Mr. E. W. Kramer, representing Federal Power Commission.

Walker R. Young, U. S. Reclamation Bureau.

J. D. Galloway, Walter Huber, F. C. Herrmann, F. H. Tibbetts, consulting engineers.

J. E. Lippincott, consulting engineer.

C. A. Bissell, United States Reclamation Bureau, Washington, D. C.

T. B. Waddell, Division of Water Resources.

George W. Hawley, Deputy in Charge of Dams, Division of Water Resources.

Edward Hyatt, State Engineer.

Salinity Investigations.

The work on Salinity Investigations during the past month has been largely confined to office studies. Intensive studies and analyses are being made of the large mass of data collected during 1929. Substantial progress has been made on these studies which are designed to obtain the relation between salinity and stream flow and tidal action.

Field work has included the maintenance of automatic tide gages and the collection of salinity samples at 26 observation stations which are being maintained throughout the year. In addition, 8 new salinity observation stations were established about March 1st in the channels of Napa River, Sonoma and Petaluma creeks within the marshland area north of San Pablo Bay.

The United States Geological Survey in cooperation with this office, has completed a precise line of levels extending from Tracy at the upper end of the San Joaquin Delta, westerly and along the bay shore for the purpose of tying all tide gages to a common datum.

Salt Water Barrier Investigation.

The Salt Water Barrier Investigation is now well under way. Under a cooperative agreement with the United States Army Engineers, work has been started under Major Ropes of the First District on several important phases of the investigation, including navigation, tidal action, silt and debris movement, flood control and design features of the barrier structure. Cooperative work is also under way with the Fish and Game Commission on the fishing industry, the Department of Public Health on sewage pollution and indus-

trial use and the Division of Highways on the possible use of the barrier as a highway crossing.

Work has been started in the field on the survey of industrial and agricultural developments within the area affected by the barrier. The data and information is being gathered on carefully prepared questionnaires by representatives from this office.

Pit River Investigation.

The routine field work of the Pit River Investigation was continued throughout the month. Installations were made for determining the rate of run-off on two typical drainage areas in the "Devils Garden" district. The progress report covering the year ending September 30, 1929, was completed.

Special Investigations.

Report on the water supply of Bouquet Canyon near Saugus in southern California and an additional investigation of an alternate site at the mouth of Castaic Creek also near Saugus, for a possible prison site has been completed during the present month.

General.

The investigations being conducted in the Napa and Santa Clara valleys, in Ventura County, and on the Mojave and Santa Ana Rivers in southern California comprising studies of the water resources of these areas, have been actively carried on during the present month under the plans and procedure outlined for the conduct of this work and reported upon in our progress report submitted for January, 1930.

SNOW SURVEYS

Data to March 1st indicated that in the Tahoe Basin at Marlette Lake, the surveys show a water content of 61 per cent of the entire seasonal normal (October to May) as compared to 38 per cent up to the time of the February report. In the Yuba Basin, surveys at Summit and Lake Fordyce show a water content of 52 per cent of the entire seasonal normal and in the Mokelumne Basin the survey of the crest course at Blue Lakes shows a water content of 54 per cent of the entire seasonal normal.

Precipitation data obtained showed the following results when a comparison of the conditions to March 1st with normal were made. The northern stream basins from Upper Sacramento to Yuba, was from normal to 10 per cent below normal with the exception of Feather Basin which was 10 per cent above normal. In the central basins from the American to the Merced, precipitation ranges from about 15 per cent to 35 per cent below normal. In the southern basins from the Upper San Joaquin to the Kern, precipitation is all below normal with departures of from 35 per cent to 45 per cent below.

IRRIGATION, WATER STORAGE DISTRICTS

During the month construction work in progress in the El Dorado, Oroville-Wyandotte and Thermalito Irrigation districts was inspected and a conference was held with the officers of the El Dorado Irrigation District relative to the work being carried on by them with funds derived from the sale of bonds.

Conference between the State Railroad Commission, the Clear Lake Water Company and proponents of the Dixon Irrigation District was attended by a representative of this Division. The conference was held

for the purpose of attempting to clarify the situation with respect to an adequate water supply for the Dixon Irrigation District, an area of 5500 acres situated in northern Solano County. As a result of our studies and this conference the State Engineer has recommended against the formation of the district at this time, owing to the lack of evidence of an adequate water supply being available for this area.

Investigations are in progress in the matter of the petitions for the organization and formation of the Rio Seco and Richvale Irrigation districts. These districts include 8000 and 19,700 acres, respectively, of rice land situated in Butte County, and are now being served by the Sutter-Butte Canal Company.

The compilation of irrigation district financial data and studies has been continued through the present month. These studies are for the purpose of keeping up to date the statistical data presented in Bulletin No. 21 of this Division.

Upon recommendation of the State Engineer, the California Bond Certification Commission has approved and issued its orders covering requests made by the following irrigation districts:

For Sale of Bonds at Private Sale—

Oroville-Wyandotte Irrigation District	\$36,000 00
West Stanislaus Irrigation District	50,000 00

Approval of Expenditures for Construction and Developmental Work—

Buena Vista Water Storage District	\$942,731 11
Thermalito Irrigation District	2,591 54
Oroville-Wyandotte Irrigation District	25,181 24
West Stanislaus Irrigation District	40,000 00
Woodbridge Irrigation District	9,182 67
Vista Irrigation District	123,167 26

Total approved \$1,142,767 82

Agreement between the Coreoran Irrigation District and F. W. Cornwell for the purpose of developing additional ground water supplies within the district was approved by the Commission.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Maintenance work on the flood control project has been mostly routine during this period. The Sutter County by-passes have been mostly filled with water during this period, but nothing worthy of note has occurred. It has been necessary to operate the drainage pumping plants almost continuously.

The Dutton Dredge Company's dragline excavator has completed cleaning the East Intercepting Canal and is now engaged in cleaning and enlarging the West Intercepting Canal to the point where it connects with the new diverting canal being constructed by the California Debris Commission.

The dragline machine operated by Robert P. Easley has been transferred to the Sutter By-pass, where it has been engaged for a short time in trimming portions of the east levee and widening the crown so that the roadway may be made safe. It will proceed to clean the intercepting canals of the Pump No. 1 and Pump No. 2 systems.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

Three additional tree and steel retards are being

constructed on the right bank of the Feather River near Nicolaus, in cooperation with the county of Sutter. This work is being done by the Pacific Coast Construction Company under contract, the three retards being in addition to the seven recently completed.

Eight current retards are being constructed by the Pacific Coast Construction Company on the right bank of the Sacramento River below Knights Landing in cooperation with Reclamation District No. 730, at the Huston, Russell and Inglin ranches. This work is approximately 50 per cent complete.

The construction of the redwood timber bulkhead 850 feet long in the Sacramento River near Isleton has been completed by Leonard T. Isham, contractor, of Rio Vista. The replacement of the washed levee section with sand fill and its protection with revetment will be undertaken as soon as the river has reached its early summer low stage.

Arrangements have been made with Brannan Island Reclamation District No. 2067 for cooperative bank protection work on the left bank of the Sacramento River opposite Rio Vista. This work will consist of depositing rubble rock, maximum size 10 inches, along the bank for a distance of approximately 3000 feet. The estimated cost of this work is \$4,650.

SACRAMENTO FLOOD CONTROL PROJECT

Little progress has been made during the past period in by-pass construction clearing on account of the weather. The by-pass areas have been covered with water a good portion of the time. An additional sum of \$23,500 has been made available for by-pass clearing construction out of the "Joint navigation and flood control project fund," construction budget, by transferring to this fund sums set aside in the program for other work, which could not be accomplished in this fiscal year.

The work being done under five contracts for clearing timber in the Feather River overflow channel above Marysville is approximately 75 per cent complete.

The construction of the West Intercepting Canal by the California Debris Commission has been completed. This office has performed the incidental work necessary in connection with right of way agreements.

The surveys of the timber areas in the Butte Slough, Sutter and Tisdale by-passes, cleared and to be cleared, have been interrupted by the bad weather and overflow water, but will be resumed as soon as conditions permit.

RUSSIAN RIVER JETTY

During this period, repairs have been made to the gas shovel and some rock has been placed along the jetty. A crew of seven men has been maintained. Work will commence about April 10th on driving piles for the extension of the jetty from its present end at the water line into deep water.

An automatic recording tide gage has been set in the lagoon at Jenner, several bench marks have been set and levels run, and a current meter measurement of the discharge through the channel in the bar was made, in preparation for a study to determine the plans for the completion of the work.

FLOOD MEASUREMENTS AND GAGES

There have been several light storms during this period, but none which resulted in flood stages which would justify putting into operation the complete program of flood measurements prepared. Discharge measurements were made at the following points: Tisdale Weir, American River at Coloma, Rattlesnake Bridge and Fair Oaks and Sacramento River at the "I" street bridge.

DAMS

Applications received for dams built prior to August 14, 1929.—One hundred thirty-nine applications were received for existing dams bringing the total of such applications to 570. There are still about 110 dams for which applications have not been received. Of this number there are about 50 dams, applications for which are expected within a few days. The remaining dams consist of those about which there is some doubt as to their status, or whose owners have not been reached. Every effort is being made to inform owners of the law and evidently their failure to file has not been with intent to evade or disobey the law. In no case have owners refused to file when they were informed of their obligation.

Application for approval of plans and specifications for construction:

Dam	County	Owner	Estimated cost
Felt Lake	Santa Clara	Leland Stanford Jr. University	\$78,962
Chatsworth	Los Angeles	City of Los Angeles	3,894,065
Lake Madrone	Butte	Mansfield & McCallum	20,000

* Since August 14, 1929.

Fees received during month \$9,383.63.

Fees received to date \$57,926.19.

Application for approval of plans for repairs or alteration:

Dam	County	Owner
Rapley	El Dorado	A. J. Rapley
Arrow-Bear	San Bernardino	Arrow-Bear Company

Plans approved for construction:

Dam	County	Owner	Estimated cost
Juncal Main	Santa Barbara	Montecito Co. Water Dist.	\$388,862.82
Salt Springs	Amador	Pacific Gas & Electric Co.	6,930,000
Lyons	Tuolumne	Pacific Gas & Electric Co.	287,000
Peach Tree	Monterey	Fort Klamath Meadows Co.	800
Wrigley No. 1	Los Angeles	Santa Catalina Island Co.	14,650
Wrigley No. 2	Los Angeles	Santa Catalina Island Co.	5,500
Glendale Park Manor	Los Angeles	City of Glendale	49,300

Plans approved for alterations or repairs:

Dam	County	Owner
Eurbank No. 4	Los Angeles	City of Burbank
Belvedere	Marin	Marin Municipal Utility Dist.

Inspection of dams under construction, enlargement or repair:

Dam	County	Remarks
Almanor	Plumas	Repairs
Bear Gulch	San Mateo	Repairs
Belvedere	Marin	Repairs
Calaveras	Calaveras	Construction
Chatsworth	Los Angeles	Construction and enlargement
Glendale Brand	Los Angeles	Construction
Hansen	Los Angeles	Construction
Juncal	Santa Barbara	Construction
Lake Hodges	San Diego	Repairs
Lower San Fernando	Los Angeles	Enlargement
Lyons	Tuolumne	Construction
Mary Joe	San Diego	Construction

Dam	County	Remarks
Merced Falls	Merced	Enlargement
Moccasin	Tuolumne	Construction
Peach Tree	Monterey	Construction
Salt Springs	Amador	Construction
Shaver Lake	Fresno	Enlargement
Silver Lake	Amador	Enlargement
Wrigley	Los Angeles	Construction

RUN-OFF DATA

Rainfall and run-off studies referred to in our last report have been continued through the present month to determine the required spillway capacity of dams to carry peak flows. Automatic recording rain and stream gages have been established in a few selected typical areas for the purpose of obtaining the run-off of maximum rainfall during short periods.

WATER RIGHTS

Applications to Appropriate—During the month there were 31 applications to appropriate water received. Eight were canceled and five approved.

Permits and Licenses—During the month four permits were revoked.

ADJUDICATIONS

Shasta River (Siskiyou County)—The final reply brief covering the issues raised by exceptions to the Division's Order of Determination was completed and filed with the Superior Court.

Whitewater River Adjudication (Riverside County)—A field inspection was made of various incomplete water appropriation projects. Two orders were entered granting extensions of time to complete incomplete appropriations.

Clover Creek (Shasta County)—The Division's report as referee in the Clover Creek court reference and exhibits thereto were completed and filed with the Superior Court.

Davis Creek (Modoc County)—A tentative stipulation for consent judgment has been prepared for submission to the water users involved in the Davis Creek court reference at a meeting to be held March 18th.

Mill Creek (Modoc County)—A proposed schedule of distribution has been prepared for submission to the water users involved in the Mill Creek court reference at a meeting to be held March 18th. It will be recommended that this schedule be administered by a water master during the 1930 season, as a trial allocation.

Water Distribution—The water master reports covering the 1929 season for Owl, Soldier and Emerson creeks, all in Modoc County, have been completed. Water master service for the 1930 season has been commenced on these streams.

It seems that one of the employees of Henry Ford dreamed that Henry died. He dreamed that he saw the black casket being borne by six of Henry's oldest and most faithful employees. As the casket came by, Henry raised up, looked around, and offered the following suggestion:

"If you would put rollers under this casket, you could lay off five men."—*Sour Owl*.

Stenographer—"Howja spell sense?"

Employer—"Dollars and cents, or horse sense?"

Stenographer—"Well, like in 'I ain't seen him sense.'"—*Kreolite News*.

Offer Trophy for Safety Work in State Highway Patrol Contest

By HELEN LUCILE HOLT, Director, Safety Conference, California State Chamber of Commerce.

THE California State Chamber of Commerce is deeply appreciative of the efforts being made by the State Department of Public Works through the California Highway Patrol to regulate and control traffic in the interest of public safety.

This loyal group of men, who every day are facing the problems of keeping the traffic on our highways moving in an orderly fashion, are unquestionably making a great contribution to the happiness, welfare and safety of the motorist.

It is with this in mind, and in recognition of the work which is being done, and, in the hope that we may be able to secure a complete report of the concrete safety work being done by this group of men, that the Board of Directors of the State Chamber of Commerce has decided to offer to that division of the Highway Patrol presenting, at the end of a year's time, the most complete record of accomplishments in the safety field, a trophy to be emblematic of their value to our state.

The contest will be among the several divisions of the California Highway Patrol, and will be decided upon the basis of most effective work done in making the highways safe, and will take into consideration the relationship of the work being done to the district served, and will not be particularly governed by the size of the territory or the number of men involved, in other words, the idea is to equalize all districts, irrespective of size, and to place the contest definitely on a basis of effectiveness of program.

The award, which is to be offered, will be in the nature of a cup to be permanently held by that division winning it three times. The contest will be judged on the basis of a written report to be made at the conclusion of the contest by a proper representative of each division to the judges of the contest.

It is the hope of Mr. Wm. M. Garland, president of the California State Chamber of Commerce, that the trophy will be presented in person by the Governor of the State of California, the Director of the Department of Public Works, the Chief of the State Division of Motor Vehicles, the Superintendent of the

California Highway Patrol and representatives of the State Chamber of Commerce.

The State Chamber recognizes the fact that the California Highway Patrol will carry on just as effective work should there not be a contest among the divisions, but is specifically carrying out the contest in order that the state, as a whole, may become more aware of the safety work being done by the Patrol, and more than this, that other states in the United States may profit from our splendid achievements. We are already sufficiently aware of the fine work being done, but the contest will enable us to present concrete written achievements.

The California State Chamber of Commerce desires to congratulate Mr. Meek, Chief Snook and Mr. Biscailuz on the courteous and efficient work being done by the California Highway Patrol.

PARIS ADOPTS PARKING RULE

For the first time in its history Paris has adopted a half-hour parking limit.

Increased registrations of automobiles led to the rule, which applies to the entire downtown district.

Parking lots in three classes are provided: "R" lots for car owners living or working in the immediate vicinity, "M" lots for car owners who do not live in the vicinity, and "pay" lots.

TEXAS—Bexar County has created an innovation in county highway systems by adopting uniform and standard marking for its roads.

DELAWARE—A highway devoted to industrial traffic only is proposed to be built from Wilmington along the Delaware River to Philadelphia.

ARIZONA—This state has embarked on a program of highway and bridge construction covering a period of ten years at an estimated cost of \$50,000,000.

A colored man got his nerve together and took a flight in an airplane. As he climbed out of the ship on its return to the field, he turned to the pilot and said:

"Suh, Ah has to thank you fo' both dem rides."

"What are you talking about?" said the aviator. "You only had one."

"No suh," returned the passenger "Ah done had two—mah fust an' mah last."—Round Table.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

As of March 1, 1930, the state has registered 1,699,069 automobiles, 13,670 solid tire trucks, 64,479 pneumatic tire trucks, 6,386 motorcycles, 7,932 solid tire trailers and 25,338 pneumatic tire trailers. In comparing these figures with the total registrations of 1929, we find that only 210,294 automobiles, trucks, trailers, etc., remain unregistered to date. This reduction is accounted for through the number of vehicles that are in dealers' possession that have been reported on inventory forms, and those commercial vehicles that are used in seasonal hauling and are not registered until needed by their owners. We feel confident that the total registration for 1930 will surpass 1929. The total fees received as of March 1 are \$7,872,462.22. This sum will likewise be increased, but, due to a decrease in commercial fees, it is possible that the total fees will be smaller than those collected in 1929.

On March 1 approximately the same number of motorcycle and trailer dealers had been licensed as in 1929. There is a decrease of 557 in the number of automobile dealers for 1930 compared to 1929. This number no doubt will be increased as the year progresses.

The total number of the Highway Patrol personnel at this time is 304 officers, men and clerks, exclusive of the administrative officials and clerical personnel at the Sacramento office.

During the month of February, 15,895 persons were stopped by the officers of the Highway Patrol and 5315 arrests made. The Patrol covered 465,230 miles during the month.

To date approximately 700 concerns and individuals have made application to be authorized as brake testing stations. Of this number 410 have been inspected and approved. Investigations are still being made on the remaining applications.

In several districts the inspectors have been supplied with necessary equipment for weight testing of commercial vehicles under the revised provisions of the California Vehicle Act. Every district inspector will be supplied with this equipment very soon, and rigid enforcement in this connection will be carried on extensively.

Arrangements have been made to establish the first school of traffic instructions at Sacramento. For this purpose a cooperative agreement has been made with the government to use Mather aviation field. It is expected shortly that all will be in readiness to call in the traffic officers for their preliminary instructions.

The following persons were appointed members of the California Highway Patrol during the month of March:

INSPECTOR APPOINTED

Ray Franck of Redding has been appointed inspector for the district comprising Shasta, Trinity, Siskiyou and Tehama counties. Headquarters at Red Bluff.

TRAFFIC OFFICERS NAMED

Following are appointments to the various counties:

Contra Costa County—Richard H. Trembath, George R. Cockerton, Wilfred H. Kennerley, Charles E. Boomhower.

Alameda County—Harold T. Hendricks, William A. Hamilton, George J. Barron, Anthony Enos.

Amador County—Vernon J. Farewell, Harrison M. Shear.

Merced County—Donald Halterman, Niel C. Nicholson, Chas. F. Sloat.

Napa County—Eugene C. Riordan, Joseph P. Mathews.

Fresno County—Will J. Eudaly, B. H. Schallenberg.

Marin County—Ivan A. Carbine, Vernon E. Dwelly, Thos. H. Wentworth.

Placer County—H. A. Duryea.

Sacramento County—John A. Daroux, Jack A. Thielen, Thos. Robinson.

Santa Cruz County—Victor C. Calhoun, Arthur E. Day.

Glenn County—Irvine C. Kimball.

NEW REDWOOD PARK ADORNS STATE HIGHWAY

(Continued from page 4.)

remains is brushed out and in good condition for a road of the corduroy type. It passes through richly massed redwoods with very luxuriant undergrowth and is well worthy of being reinstated as a slow, rambling route. Its course through the park as proposed is about five miles in length."

Within the confines of the park are fragments of the old Eureka pack trail, famous in the days of the pioneer. Mr. Knight recommends that an effort be made to awaken interest in this historic old relic, so that it may be reestablished as a link with the romantic early days.

"The entrance to the park, from both north and south, is an important factor if the unique beauty and appeal of this area are to be enjoyed to the full. Beginning in a key almost commonplace, and gradually increasing in charm and interest as the traveler progresses into the recesses of the park, the climax is finally reached, as the view discloses suddenly a scene of superb redwood forest etched against the dramatic background of the ocean. Although the northern and southern approaches can not compare in any way with the grandeur in store for the traveler farther along, they are of tremendous significance to the "tone" of the park as a whole. Unsightly structures in the way of roadside refreshment stands and other obstructions to the loveliness of the countryside must be so dealt with that there may be no jarring note, in order that the visitor to the park may reap the fullest possible aesthetic enjoyment and spiritual benefit therefrom."

Buck: "Can you give me a definition of an orator?"

Private: "Sure. He's the fellow who's always ready to lay down your life for his country."—*Kenebec Journal*.

NEW DESIGNS IN HIGHWAY CONSTRUCTION

(Continued from page 2.)

type of structural member, beam, or otherwise is designed to resist the stresses and strains of service. Greater unit strengths in concrete are being obtained than ever before. All other types of pavement, including even the low type temporary gravel or crushed rock, are laid with the utmost scientific care in selection of materials, placing, etc., to insure smooth, durable surfaces.

The importance of suitable subgrade and drainage is realized fully.

The design of this factor is considered to be as important fundamentally as the design of the pavement itself, and is now given its full share of consideration.

Practically all important paved state highways are being divided by plainly visible white traffic stripes into well defined traffic lanes. This work was started about a year ago and is being pushed toward completion as rapidly as possible.

GRADE CROSSING ELIMINATION

This work is being pushed forward as fast as funds become available therefor.

DRAINAGE

Although the importance of this factor always has been recognized, it is being given increasing attention in connection not only with the disposal of surface drainage but also in connection with subgrade pavement foundations and appearance. In flat country deep parallel side borrow ditches, such as were often in times past designed to supply material for roadway fills, are no longer permitted as they are considered unsightly, unhealthy in that they often hold stagnant water and breed mosquitoes, and are dangerous. During the past two or three years, many such ditches have been backfilled and eliminated, often in connection with shoulder widening.

LANDSCAPING

Increasing attention is being paid to this factor of design, especially on recreational roads. Engineers of the Division of Highways are trained to give special attention to the aesthetics of highway designs and to avoid wherever practically possible destruction or injury of trees, streams, parking sites, and all types of scenery and natural or cultivated beauty.

Roadside tree planting is encouraged, the

state usually assuming responsibility for the care but not the planting of the trees.

Especial attention is given during both location and construction to the development of wide shoulder parking sites at points where good views may be obtained.

JOINT HIGHWAY DISTRICTS

One of the most important recent trends has been the development of the joint highway district. In line with certain requirements prescribed by law, two or more counties may form a joint highway district to construct an important road, and may request and, subject to the state's approval, may receive state aid in the form of financial contributions and engineering advice. This naturally leads toward higher standards of construction and better coordination of the county road systems.

The preceding notes present only a few of the more important improvements in the trend of modern highway design. It may be stated briefly that the current policy of the California Division of Highways is the production of highways which will at all times provide to the public the fullest measure of transportation service and satisfaction.

TEST YOURSELF

The following definitions are given in the *Wisconsin Engineer* as answers one of the professors received in a vocabulary test:

tandem—trance, riot, uproar.
palpable—pleasing to the taste, very fine, excited.
façade—a period of five years.
ludicrous—delicious.
askance—can have for asking.
exorcise—to kill one's wife.
intrigue—poison for insects.
chimera—animal which changes color with environment.
nostalgia—bunch of flowers.
marital—pertaining to the sea.
maritime—period of marriage.
bovine—sad, melancholy, pertaining to a dog.
polygamy—worshipping more than one god.
equestrian—a judge.
science—dealing with things that are not understood.
category—a bag of tricks.
tent—one who occupies another's property.
weal—small water animal.

FROM THE OLD SCOTCH

Scotch Father (out riding)—Wee Sandy, why are ye a-hidin' under the lap-robe?

Sandy—Whist Father, dinna ye see the toll bridge we're a-coming to?

Father (quickly)—Hoot lad, move over so that your mither can get under wi' ye.

"Why is Jones looking for a cashier, he only hired one last week."

"That's the one he is looking for."

Improvements in Highway System Secured Through March Contracts

REDWOOD HIGHWAY

Two grade eliminations on this highway were made possible by the following contracts:

In Marin County an overhead crossing over the tracks of the Northwestern Pacific Railroad at Forbes Station consisting of one 46-foot steel beam span and 190 feet of timber trestle on pile bents. This grade separation is on the new alignment just north of San Rafael. Grading and paving of this section is now under construction. Rocca and Caletti of San Rafael was awarded this contract for \$16,170.

In Humboldt County an undergrade crossing at Loleta under the same railroad tracks and being situated on the recently constructed realignment on that portion of the Redwood Highway between Loleta and Beatrice. Fred J. Maurer and Son of Eureka were awarded this contract for \$10,880.

PACIFIC HIGHWAY

In Glenn County on the West Side Pacific Highway between Logandale and Willows, 5.2 miles will be paved with Portland cement concrete. This pavement is to be placed on the recently graded 33-foot roadbed over this section of the highway and is the final step in its three-stage construction. The first stage of construction consisted of grading. The second was the placing of a 12-inch gravel subbase, which raised the grade sufficiently to protect the roadbed from the possible overflow of water from the irrigation of the adjoining rice fields. The present improvement has been shifted to the west so that the center line of the ultimate 40-foot pavement will be centered in the 100-foot right of way. This contract was awarded to Basich Brothers Construction Company of Los Angeles for \$146,319.

TAHOE-UKIAH HIGHWAY

In Lake County between Middletown and the old Williams road, 23 miles will have light fuel oil furnished and applied as a dust layer. The Basalt Rock Company of Napa was awarded this contract for \$5,842.

MOTHER LODGE HIGHWAY

The grading and surfacing with crusher run base and untreated crushed gravel or stone for 2.8 miles on either side of Calaveritas Creek, makes another important improvement on this highway, replacing the present narrow and crooked road with a graded roadbed of 24 feet and surfacing 20 feet wide. Larsen Brothers of Galt is the contractor for a price of \$45,494.

VALLEY HIGHWAY

In San Joaquin County two important contracts have just been let for improvement of the section between Lodi and Stockton.

Between Cherokee Station and Harney Lane, 6.9 miles will be graded 36 feet wide and paved with Portland cement concrete 20 feet. This construction replaces the old 16-foot bituminous macadam built by the county. This contract was awarded to T. M. Morgan Paving Company of Los Angeles for \$251,562.

Another contract in conjunction with the above mentioned road construction is the building of four reinforced concrete girder bridges over Calaveras River, and Mosher, Bear and Live Oak creeks. Each bridge will have a clear roadway width of 34 feet. Jacobs and Pattiani of Oakland are the contractors for a price of \$48,875.

CREST DRIVE

H. W. Rohl Company of Los Angeles received the award of contract for grading 1.9 miles in San Bernardino County between The Pass and Waterman Canyon. This improvement is another sector of one of southern California's recreational highways and is on an entirely new alignment of that portion of the Crest Drive from The Pass between Waterman Canyon and Devils Canyon down Waterman Canyon. This project will bring to modern standards of mountain highway construction the worst section of the road from San Bernardino to Big Bear Lake. The present old road has grades as steep as 16 per cent and curves so sharp that stages and trucks negotiate them with great difficulty. Contract price on this improvement, \$100,372.

COMPLETION OF CONTRACTS

PACIFIC HIGHWAY

O. F. Brown of Sacramento recently completed a contract for moving buildings, appurtenances and utilities from the state right of way through Wheatland, in Yuba County, at an approximate cost of \$2,670. In Sacramento County Mr. Brown recently completed another contract for moving buildings from the state highway right of way about 8 miles north of Sacramento at an approximate cost of \$495.

VALLEY ROUTE

Contract for constructing an undergrade crossing near Califa, Madera County, under the S. P. Railroad has been completed at an approximate cost of \$32,700, and accepted as satisfactory. Otto Parlier of Tulare was the contractor.

Another contract in Madera County for constructing a graded roadbed and placing asphaltic concrete surfacing between Califa and the northerly county boundary, for about 5.6 miles, and at an approximate cost of \$148,600, has been completed and accepted. A. Teichert and Son of Sacramento were the contractors.

COAST HIGHWAY

A contract for widening the pavement with oil-treated crusher run base between Eagle Creek and El Capitan Creek, Santa Barbara County, for a distance of 5.5 miles and at an approximate cost of \$17,483 has been satisfactorily completed. Cornwall Construction Company of Santa Barbara was the contractor.

Another contract on this route in Ventura County for super-elevating curves on the Conejo Grade at an

approximate cost of \$2,800 has been completed. Griffith Company of Los Angeles was the contractor.

SAN DIEGO-EL CENTRO HIGHWAY

Basich Brothers Const. Company of Los Angeles just recently completed the constructing of graded roadbed and placing Portland cement concrete pavement between Pine Valley and Kitchen Creek, in San Diego County, for a distance of 7.2 miles at an approximate cost of \$309,000.

HIGHWAY BIDS AND AWARDS For Month of March

CALAVERAS COUNTY—Between $1\frac{1}{2}$ miles north and $1\frac{1}{2}$ miles south of Calaveritas Creek, about 2.8 miles in length to be graded and surfaced with crusher run base and untreated crushed gravel or stone. Dist. X, Rt. 65, Sec. B. W. H. Hauser, Oakland, \$53,582; Lord & Bishop, Oroville, \$67,586; Mathews Const. Co., Sacramento, \$48,803; Chigris & Sutso, San Francisco, \$50,087; Tieslau Bros., Berkeley, \$56,407; M. J. Bevanda, Stockton, \$56,786; A. J. and J. L. Fairbanks, Ins., South San Francisco, \$58,963; W. C. Cooley, Berkeley, \$56,776; Hemstreet & Bell, Marysville, \$55,660; A. Teichert & Son, Sacramento, \$62,105; Kennedy-Hayles Const. Co., Oakland, \$57,714. Contract awarded to Larsen Brothers, Galt, \$45,494.25.

GLENN COUNTY—Between Logandale and Wilows, 5.2 miles to be paved with Portland cement concrete. Dist. III, Rt. 7, Sec. A. T. M. Morgan Paving Co., Los Angeles, \$162,986; M. J. Bevanda, Stockton, \$168,487; N. M. Ball, Porterville, \$164,670; Fredrickson & Watson, Oakland, \$162,298; C. W. Wood, Stockton, \$155,698; Mathews Const. Co., Sacramento, \$163,123; Hanrahan Co., San Francisco, \$162,919. Contract awarded to Basich Bros., Los Angeles, \$146,319.

HUMBOLDT COUNTY—An undergrade crossing under the Northwestern Pacific tracks at Loleta. Dist. I, Rt. 1, Sec. G. Smith Brothers, Eureka, \$11,586. Contract awarded to Fred J. Maurer & Son, Inc., Eureka, \$10,880.40.

LAKE COUNTY—Between Middletown and the Old Williams Road, on the Tahoe-Ukiah Route, 23 miles to have light fuel oil dust layer applied. Dist. IV, Rt. 49, Secs. A, B and C. C. W. Wood, Stockton, \$8,259; Deysher & Lafargue, San Anselmo, \$6,520; Geo. French, Jr., Stockton, \$6,955; C. F. Fredericksen & Sons, Lower Lake, \$7,071; Lee J. Immel, Berkeley, \$8,954; J. A. Casson, Hayward, \$6,404; Chas. Kuppinger, Lakeport, \$6,694. Contract awarded to Basalt Rock Co., Napa, \$5,824.37.

MARIN COUNTY—Overhead crossing over the tracks of the Northwestern Pacific R. R. at Forbes Station. Dist. IV, Rt. 1 Sec. A. M. B. McGowan, San Francisco, \$19,725; W. L. Proctor, Santa Rosa, \$17,919; Fredrickson & Watson, Oakland, \$19,963; A. T. Howe, Santa Rosa, \$17,052; Healy-Tibbitts Const. Co., San Francisco, \$21,365. Contract awarded to Rocca & Coletti, San Rafael, \$17,170.50.

SAN BERNARDINO COUNTY—Between The Pass and 2 miles down Waterman Canyon, 1.9 miles to be graded (on new alignment). Dist. VIII, Rt. 43, Sec. A. George Pollock Co., Sacramento, \$108,892; J. G. Donovan & Son, Los Angeles, \$103,277; Lewis Construction Co., Los Angeles, \$147,808; Gist & Bell, Arcadia, \$103,927; Sander Pearson, Santa Monica, \$120,789; O. A. Lindberg, Stockton, \$115,741; Triangle Rock & Gravel, San Bernardino, \$115,493;

C. G. Willis & Son, Los Angeles, \$106,095; Pearson & Dickerson, Riverside, \$174,352; J. P. Holland, Inc., San Francisco, \$101,757. Contract awarded to H. W. Rohl Co., Los Angeles, \$100,372.

SAN JOAQUIN COUNTY—Between Cherokee Station and Harney Lane, four reinforced concrete girder bridges between Lodi and Stockton across Calaveras River, Mosher, Bear and Live Oak creeks. Dist. X, Rt. 4, Sec. C. Fredrickson & Watson Const. Co., Oakland, \$50,056; M. J. Bevanda, Stockton, \$56,722; J. F. Knapp, Oakland, \$49,823; Bodenhamer Const. Co., San Diego, \$60,797; N. M. Ball, Porterville, \$64,914; Geo J. Ulrich Const. Co., Modesto, \$51,803; M. B. McGowan, San Francisco, \$56,726. Contract awarded to Jacobs and Pattiani, Oakland, \$48,875.

SAN JOAQUIN COUNTY—Between Cherokee Station and Harney Lane, 6.9 miles to be graded and paved with Portland cement concrete. Dist. X, Rt. 4, Sec. C. Isbell Const. Co., Fresno, \$290,120; Healey-Moore Co., Oakland, \$314,389; C. W. Wood, Stockton, \$259,579; M. J. Bevanda, Stockton, \$264,808; J. F. Knapp, Oakland, \$269,845. Contract awarded to T. M. Morgan Paving Co., Los Angeles, \$251,562.50.

ARCHITECTURAL AWARDS For the Month of March

STATE FAIR GROUNDS, Sacramento. Contract for general work in the Live Stock Unit, awarded to McGillivray Construction Co. of Sacramento; price, \$118,205.

Contract for plumbing work, same building, awarded to Luppen and Hawley, Sacramento, price, \$9,564.

Contract for electrical work, same building, awarded to Latourrette-Fical Company of Sacramento; price, \$2,400.

INDUSTRIAL HOME FOR ADULT BLIND. Contract for construction of new Broom Factory, awarded to A. Fredrick Anderson of Oakland; price, \$24,260.

PUBLIC WORKS BUILDING, Sacramento. Contract for ventilating and roof sprinkling system, awarded to McLaughlin Sheet Metal Works of Sacramento; price, \$6,645.

MENDOCINO STATE HOSPITAL, Talmage. Contract for building crematory furnace awarded to J. T. Thorpe & Son, Inc., San Francisco; price, \$2,530.

CHICO STATE TEACHERS COLLEGE, Assembly Building. Contract for general work, awarded to Campbell Construction Company of Sacramento; price, \$133,616.

Contract for plumbing, heating and ventilating on above award to Frederick W. Snook Company of San Francisco; price, \$18,523.

Contract for electrical work on above, awarded to Alta Electric Company of San Francisco; price, \$13,904.

HE MIGHT AS WELL

Prospective Car Buyer—I want to buy a car that will do one hundred miles per hour, forty miles on a gallon of gas, ride like an easy chair, turn in a thirty-foot street, cost not more than \$500, and run for years without any repairs. What would you suggest?

Salesman—Walk.

FLOODLIGHTING THE STATE CAPITOL

(Continued from page 6.)

effect is provided by mounting 24 200-watt Type C lamps in Crouse-Hinds vaporproof fittings with ruby globes on the inside of the dome, one over each window. These lamps are not lighted when the general floodlighting is on, but are used on special occasions to provide a red silhouette effect.

To assist the floodlighting to overcome the lost reflection due to the extremely dark weathered copper surface of the dome, 1200 10-watt lamps are mounted on the ribs of the dome and around the edge of the smaller dome, capping the entire structure.

COST FIGURES

The installation represents a total connected load of 62.4 k.w. It is arranged on a 3-phase, 4-wire system. It is controlled by Diamond H contactors with push-button stations located in the basement.

The cost of the entire installation was approximately \$7,000.

The system is in operation every night of the year from 8 to 11 o'clock in the evening. The operating cost per day is as follows:

Current	\$3 74
Lamp renewals and depreciation ..	0 75
Interest on investment	1 34

Total daily cost

The installation was executed under contract by the Latourrette-Fical Company of Sacramento.

MARCH CONTRACTS LET BY ARCHITECTURE DIVISION

During March contracts have been awarded for work of the Division of Architecture having a total value of \$297,031. These projects included work on additional wings for the San Francisco State Building, the Live Stock Unit at Agricultural Park, Sacramento, the Broom Factory at the Industrial Home for the Adult Blind in Oakland, and improvements upon the Public Works Building, Sacramento, and also at the Mendocino State Hospital.

THE COURTEOUS MOTORIST

"Which do you like better, balloon tires or high-pressure tires?"

"I like balloon tires better."

"What kind of a car do you have?"

"I don't have any; I'm a pedestrian."

Appel—"My son is a jack of all trades. What shall I do with him?"

Sass—"Buy him a drug store."

HIGHWAY MILEAGE IN EUROPE
AND THE UNITED STATES

The following figures showing comparative highway figures for the United States and Europe are taken from the 1929 edition of Highways Handbook published by the Highways Education Board of Washington, D. C.:

	Miles in Europe	Miles in United States
Unimproved	58,098	2,390,144
Earth, sand, clay or gravel, graded and drained	1,178,458	458,982
Water bound macadam	370,857	64,596
Water bound macadam, sur- face treated	6,880	-----
Bituminous or penetration macadam	6,428	30,153
Asphalt	3,680	9,155
Cement concrete	1,102	55,274
Stone, block or paving brick ..	12,209	4,628
Not specified	812,626	379
Total	2,450,430	3,016,281

The same authority gives the following additional data:

	Europe	United States
Area to 1 mile of road	4,208	1.00
Automobiles	4,140,126	24,629,921
Automobiles to 1 mile of road	1.69	8.17

Highways Stir Praise of Visitor.

This from the Los Angeles Times:

Visiting Los Angeles for the first time since 1901, John B. Drake, vice president of the Drake Hotel Company of Chicago, operator of the Blackstone and Drake hotels in the midwestern metropolises, expressed himself as amazed at the development that has taken place in the last three decades.

Drake was particularly impressed with California's highways, on which he motored in northern and central California before coming to Los Angeles. The state's highways, he commented, are the best he has seen in the country.

"California has been a revelation to me," Drake said. "I think it would be a good thing if easterners could visit here and see what is happening."

Drake declared that American business is showing steady improvement and that he looks for a return to normal conditions within a few months.

TRY HORSEBACK

One of our statisticians says that he would rather be sunburned on his vacation than tanned on a weekend.

Fair One: Now before we start for this ride, I want to tell you that I don't smoke, drink or flirt. I visit no wayside inns, and I expect to be home by ten o'clock.

Young Gallant: You're mistaken.

Fair One: You mean that I do any of those things?

Young Gallant: No, I mean about starting for this ride.

SAN JUAN GRADE DECISION IS ANNOUNCED

(Continued from page 9.)

and discussed and explained in the various conferences and discussions already referred to.

In your letter you state that it has been determined "to handle the San Juan Grade situation in the following manner:

1. Proceed to make the necessary surveys, plans and estimates of cost to relocate the 'Coast Highway' westerly of the present San Juan Grade, as indicated on the blueprint marked, 'Suggestion No. 2,' and make provision for starting the construction thereof in our next budget.

2. Retain and maintain the present San Juan grade as a part of the state highway system to constitute an extension of the present Hollister county seat lateral, such extension to run from San Juan Bautista over the grade to a new connection with the projected, relocated 'Coast Highway' at a point south of the present grade; also shown on said blueprint.

3. Relinquish the short unit now in the 'Coast Highway,' between San Juan Bautista and the point where the new relocation would depart from the present road north of San Juan Bautista, to the county of San Benito, this unit to be maintained by the county."

It is proposed that the section of the Coast Highway to be constructed will commence at the present Coast Highway, a short distance north of San Juan Bautista and extend in a general southerly direction to a point south of San Juan grade, and there connect with the present Coast Highway. The distance from the point where construction begins on the coast line north of San Juan Bautista to the point where the new construction will connect with the present highway south of the San Juan grade is approximately the same as the distance between these points along the present state highway through San Juan Bautista and over the San Juan grade.

Some of the reasons for the relocation of this section of the Coast Highway are stated in your letter as follows:

- "1. The present San Juan Grade can not, within reasonable engineering possibility and within the limits of justifiable expenditure of public funds, be made to meet the traffic and safety requirements of the main north and south trunk line of the state highway. In other words, it has passed the peak of its adaptability and usefulness for such major trunk line uses.

The exhibits heretofore submitted to you bear this out through statistical data.

The relocation will vastly improve grades and curves, increasing, of course, the carrying capacity of the road and adding to the safety and expedition of travel and transportation.

A few interesting figures may show the merits of the new line.

The highest point on the present road is 1015 feet; the highest point on the new road will be 550 feet. The length of adverse grades will be cut in half. The minimum radius curve on the present road is 100 feet; on the relocation 1000 feet. Total number of curves on the old road is 113; on the new line 38. The minimum sight distance on the present road 75 feet; on the relocation, 600 feet.

The relocation will afford opportunity for construction at low cost of a safe, convenient road

adapted to indefinite expansion as traffic requires, and capable of handling traffic safely at any reasonable speed fixed by law."

Your statement just quoted is fully supported by the reports of engineers heretofore submitted.

The advantages that will result from the elimination of San Juan grade and the adoption in lieu thereof of the section to be constructed thus plainly appears.

These advantages are substantial, are not temporary, but on the contrary are permanent and will grow in magnitude with the increase of traffic over the Coast Highway which inevitably will occur.

The public purpose that will be subserved justifies the new construction and the abandonment of the portion of the coast highway known as San Juan grade, and likewise justifies the relinquishment to the county of the portion of the present state highway extending from San Juan Bautista northerly to the point at which the new construction begins, and it is my view that this change may legally be effected.

Section 363b of the Political Code, as amended in 1929, is as follows:

"The Commission is hereby granted the power to alter or change the route of any road and to abandon any portion thereof, under the jurisdiction of the Department of Public Works (whenever and wherever) in the opinion of the Commission such alteration, change or abandonment shall be necessary or advisable by reason of alteration or revision in alignment of portions of routes of state roads or highways or shall be for the best interests of the state."

In terms this section seems ample to warrant the determination of the Commission in this regard. However it may well be questioned how far the legislature may go in view of the provisions of the State Highway Act of 1909, and subsequent state highway acts, for the reason that these several highway acts were referendum measures. But I am not inclined to enter into an examination of this particular question, for it is my view that the proposed changes may legally be made without regard to this section of the Political Code.

I am aware that the State Highway Act of 1909, under which the Coast Highway was constructed, provides that

"All highways constructed or acquired under the provisions of this act shall be permanently maintained and controlled by the State of California."

In 1926 the Highway Commission was considering a change in the state highway in Tulare County. As theretofore constructed the highway extended through Visalia the county seat, and it was proposed to adopt a new section of the state highway which would leave the city of Visalia off the main highway, but connected therewith by a lateral. The question thus presented in its legal aspects was quite similar to the one now being examined, and on February 13, 1926, I advised that the change then being considered could legally be made, and in referring to the provisions of the Highway Act of 1909, heretofore quoted, I said:

"This is a mandatory provision and full force and effect must be accorded to it. I can not give to this provision however a construction which would cast upon the state the burden of maintaining a section of a highway after such section had, by reason of highway improvement made for the purpose of correcting curves, grades, or shortening distance, eliminated such portion from the highway and rendered it thereafter unneeded and unuseful. Nor can I give to this provision a construction which would prevent the proper and

1929 Grade Crossing Accident Record

The number killed and injured at grade crossings in California was higher in 1929 than in any previous year, the casualties amounting to 1154 (including 200 killed and 954 injured), as compared with the previous peak of 957 in 1927, and 897 in 1928. Included in these figures are accidents at all crossings, including private crossings but excluding accidents between crossings, according to a report compiled by J. G. Hunter, transportation engineer of the State Railroad Commission.

The following table shows the statistics since 1913, in which year there were a total of 460 casualties. It will be noted from this table that the casualties per 10,000 motor vehicles have substantially decreased since 1913, although practically the entire decrease was during the years 1913 to 1918.

Since 1918, and during the last twelve years, there has been no marked increase or decrease in the casualties per 10,000 motor vehicles. Motor vehicle registration has increased from approximately 125,000 in 1913 to 2,000,000 in 1929.

Year	Casualties			Motor vehicle registration	Casualties per 10,000 vehicles
	Killed	Injured	Total		
1913	83	377	460	122,444	37.6
1914	93	378	471	148,235	31.7
1915	73	338	411	190,196	21.6
1916	103	337	440	263,434	16.7
1917	117	231	348	337,333	10.3
1918	69	152	221	390,773	5.7
1919	78	199	277	503,522	5.5
1920	104	260	364	595,187	6.1
1921	96	297	393	698,343	5.6
1922	128	392	520	878,108	5.9
1923	134	392	526	1,114,977	4.7
1924	129	454	583	1,331,719	4.4
1925	169	560	729	1,451,543	5.0
1926	139	629	768	1,610,770	4.8
1927	194	763	957	1,702,639	5.6
1928	165	732	897	1,822,262	4.9
1929	200	954	1154	1,983,969	5.8

persistent efforts made by highway authorities to improve state highways by correction of curves, reducing grades and shortening distance, though such improvements of necessity must result in the abandonment of sections of roads theretofore constructed and theretofore used and maintained.

The language from the opinion just quoted is applicable to the present problem, and I conclude that the proposed relocation of the Coast Highway may be legally made.

This conclusion however makes necessary the consideration of a question necessarily resulting from it.

The abandonment of that portion of the Coast Highway known as San Juan grade and the portion thereof extending northward from San Juan Bautista to the point of intersection of the new construction with the present state highway would leave Hollister, the county seat of San Benito County, without a direct state highway connection with the Coast Highway. The Highway Act of 1909, and subsequent acts, require that all county seats not situated upon a main highway shall be connected therewith by a lateral. This requirement justifies the Commission's determination to maintain the San Juan grade as a part

of the lateral connecting Hollister with the Coast Highway, and by its maintenance Hollister has the connection with the Coast Highway contemplated by the statute.

It may be added in passing, that through the maintenance by the county of the portion of the Coast Highway north of San Juan Bautista, Hollister will in fact be connected with the state highway at a point north of San Juan Bautista, as well as at the point south of San Juan grade.

My conclusion is that all that is proposed to be done, as indicated in your letter, may be legally done.

I have not overlooked the suggestion in your letter that the legislature may hereafter "by statutory enactment reincorporate" that portion of the state highway north of San Juan Bautista to be abandoned "in the state highway system." This may and doubtless should be done, but this future possibility should not be taken into consideration in dealing with the legal question before me.

Very truly yours,

U. S. WEBB,
Attorney General.

State Highway Progress Reports

COLUSA COUNTY

The widening of the roadbed to a uniform width of 26 feet between Colusa and Meridian was completed by C. R. Merrill, contractor, on February 6. The work involved the placing in embankment of more than 25,000 cubic yards of earth to widen the shoulders to four feet on each side of the existing 18-foot Portland cement concrete pavement.

Plans and estimates have been completed for grading of state highway between Bear Creek and a point $5\frac{1}{2}$ miles west of Williams.

Plans and estimates have been completed for proposed improvement between Williams and Maxwell. The proposed work is to consist of constructing a graded roadbed from material to be excavated from a drainage ditch on the west side of the right of way and installing the necessary drainage structures. This is to be followed as soon as permissible with the placing of a blanket of gravel 12 inches thick over the entire width of the fill. After bridges are built and sufficient time has elapsed to allow for the fills to settle, a Portland cement concrete pavement will be constructed. The paving is scheduled in the tentative program for the S3d and S4th fiscal years.

DEL NORTE COUNTY

The Holdener Construction Company which has the contract for stockpiling crushed rock screenings over 39 miles of the Redwood Highway between Elk Valley and the Oregon line have engaged Smith Bros. to complete the work and the contract is approximately complete.

Smith Bros. have also completed their contract for placing corrugated metal pipe underdrains along the state highway between a point approximately five miles east of the Crescent City and the Hionchi Bridge over Smith River.

EL DORADO COUNTY

Fourteen thousand cubic yards of excavation of the 88,000 cubic yards required to complete the $1\frac{1}{2}$ miles of new 24-foot graded roadbed between Bay View Rest and one mile north of Eagle Falls, has been placed in embankment by Nate Lovelace, contractor. Work is behind schedule and every effort is being made to speed up the work with a view to causing as little inconvenience as possible during the coming summer to traffic, which will have to be carried through construction.

GLENN COUNTY

Proposals for the construction of 5.2 miles of 20-foot Portland cement concrete pavement between Logandale and Willows was advertised for March 26, 1930. The work to be done consists of widening the

existing roadbed with pit run gravel to be imported from local site $2\frac{1}{2}$ miles east of the highway and constructing a Portland cement concrete pavement 20 feet wide and 6 inches to 9 inches thick (standard section).

HUMBOLDT COUNTY

The work of producing and stockpiling bituminous macadam rock along the Redwood Highway for a 20 feet by 2 inches bituminous macadam pavement between a point one mile south of Orick and the northerly Humboldt County line has been taken over by the state for completion. It is intended that this rock shall be stockpiled during the winter season in order that the Heafey-Moore Company who have the contract for placing the bituminous macadam may proceed with the work as soon as weather conditions permit next summer.

The Heafey-Moore Company who also have a contract for placing a 2 inch by 20 foot bituminous macadam pavement for 10.7 miles between Arcata and Little River expect to resume the work of completing their contract as soon as weather conditions permit, and it is understood will start the construction at Arcata and work northerly to complete to Mill Creek, approximately one mile north of Mad River.

Mercer-Fraser Company who have the contract for the construction of the new Trinity River Bridge near Willow Creek have again started operations after the winter shut down.

The E. C. Coats contract for grading and surfacing a 28-foot standard roadway on that portion of the Redwood Highway between Fish Creek and Stephens Grove in the vicinity of Miranda is expected to be well advanced by the time the touring season begins next summer. The work is now approximately 35 per cent complete.

The Engelhart Paving and Construction Company have practically completed the producing and placing of crushed rock surfacing on approximately 7.3 miles of the Redwood Highway between Dean Creek and Fish Creek, approximately six miles south of Miranda.

H. H. Boomer who has the contract for grading and surfacing a portion of the state highway, approximately 1.2 miles in length immediately north of Garberville, has continued his operations throughout the winter and the work is now approximately 15 per cent complete.

The contract for the grading and surfacing of 1.4 miles of the Redwood Highway from the southerly Humboldt County line to Richardson Grove has just been awarded to contractors, Chigris and Sutsos. The contractors have just arrived on the job and began setting up camp approximately March 25.

INYO COUNTY

From the southerly boundary to Little Lake, Fred W. Nighbert is making fair progress on his contract. Likewise, the adjoining contract which extends to

Coso Junction, which is now under construction, Fred W. Nighbert, contractor, is progressing slowly.

From Coso Junction to Olancha, the Allied Contractors, Inc., have moved in considerable equipment and forces, and every indication is that rapid progress will be made on this 21-mile stretch.

KERN COUNTY

The George Herz Company, which was recently awarded a contract between Cinco and seven miles north of Ricardo, have moved onto the job and construction is getting underway.

Between Seven miles north of Ricardo and Freeman, the G. W. Ellis Company has recently completed its contract.

The adjoining project from Freeman to the northern boundary of Kern County, which is under construction by Bartlett & Mathews-Black & Hagey, is nearing completion, but progress has not been at an entirely satisfactory rate.

LAKE COUNTY

Widening of the roadbed from 20 to 24 feet between Sweet Hollow Summit and Abbott Mine, in Lake County is about 65 per cent completed.

Grading of a 24-foot roadbed between Abbott Mine, Lake County, and Bear Creek, Colusa County, is about 40 per cent completed. No section of roadway, however, has been completely finished. Heavy rains during February retarded construction operations.

All of the foregoing is on a part of the Ukiah-Tahoe Highway and work is being done by prison road camp forces augmented by necessary skilled free labor.

The construction of 10.6 miles of the Ukiah-Tahoe Highway between Lucerne and Clear Lake Oaks was recently completed by von der Hellen, Pierson and Logan. This construction provides a graded roadbed 24 feet wide surfaced 20 feet wide by 6 inches thick with untreated crushed gravel. It is proposed to oil treat the surface as soon as possible by state forces.

LOS ANGELES COUNTY

The contract for a line change immediately north of the Newhall Tunnel has been awarded to McCray Co. Good progress is being made on this work. It is expected that this contract will be completed next June.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of roadbed was awarded to H. W. Rohl Company on August 14th. Rough grading is in progress on one and one-half miles. It is expected that this contract will be completed by next July.

The second contract on the La Canada-Mt. Wilson Highway for grading 1.5 miles of highway was awarded to T. M. Morgan Paving Company on January 27, 1930. This extends northerly from the end of the H. W. Rohl contract. This contract will probably require more than a year to complete.

A contract for paving the Newhall alternate with Portland cement concrete, 30 feet wide, has been awarded to Jahn & Bressi. Grading of this section has just been completed by LeTourneau & Lindberg. The new location is on greatly improved alignment and eliminates Saugus, Newhall and the Newhall Tunnel from the Ridge Route. This section is 8.6

miles long. Paving will probably be completed by next September.

A contract for grading and paving a line change near Liberty School, 4 miles west of Calabasas, was awarded to the Will F. Peck Company January 18, 1930. This line change eliminates several bad curves and improves the grade. Grading work is now in progress. It is expected that this contract will be completed next August.

A contract for grading a 38-foot roadbed on the first section of the Alternate Ridge Route from Castaic school to Canton Creek was awarded to H. E. Doering, von der Hellen and Pierson on February 25, 1930. This section is 7 miles in length and will probably require more than a year to complete.

Surveys are in progress on the rest of this route which will be a saving of more than 7 miles in distance over the present ridge route.

LOS ANGELES-VENTURA COUNTIES

A contract for oil mix shoulders between Calabasas and Conejo Summit has been awarded to the Southwest Paving Company. It is expected that this contract will be finished in April.

MENDOCINO COUNTY

The contract for placing a four-inch thickness of crushed gravel surfacing on portions of the Redwood Highway between a point 2 miles south of Arnold and the Sherwood-Laytonville road has been practically completed by the contractors, Hemstreet and Bell.

von der Hellen and Pierson have just been awarded the contract for constructing approximately 425 feet of rubble masonry retaining wall, approximately nine miles south of the Mendocino-Humboldt County line. The contractors have just arrived on the work and expect to begin operations immediately.

MONO COUNTY

Plans have recently been completed for the early construction of the project from Sonora Junction to four miles south of Coleville, which project follows the West Walker River and when completed will form a mecca for sportsmen and tourists.

The adjoining project from Sonora Junction south to Bridgeport is now being estimated and planned in the district office.

MONTEREY COUNTY

The new subway under the Southern Pacific Railroad at Spence five miles south of Salinas is complete. Triberti-Massaró were the contractors. The work was under the supervision of the Bridge Department. This structure eliminates a very dangerous grade crossing.

The change of line and approaches to the new bridge across the Salinas River at San Ardo are under construction by Frederickson and Watson and Frederickson Brothers, contractors. The project is about 1.5 miles in length. Satisfactory progress is being made. Ben C. Gerwick is the contractor on the bridge which is under the supervision of the Bridge Department.

Plans are being prepared for a new bridge and a major line change at the crossing of the Salinas River near Bradley.

On the San Simeon-Carmel Highway construction work is in progress with convict labor. Two camps are maintained. At Little Sur a crew of 60 men and two power shovels are working, and between Villa Creek and a point north of Alder Creek, 75 men and three power shovels are working. About 7.4 miles of graded roadway have been completed. Recent rains have caused a number of slides on this work.

Mr. H. L. Leventon who has been superintendent of the prison camp at San Simeon has resigned to accept a position with the Division of Water Resources. Mr. H. B. Henry from District II is the new superintendent.

Surveys for the location of the road are in progress between the two camps.

NEVADA COUNTY

The Callahan Construction Company on December 12, 1929, suspended work for the winter on their contract for grading and surfacing between Indian Springs and Soda Springs near the summit of the Colfax-Truckee road. The contractor will resume work just as soon as weather conditions will allow.

NEVADA AND PLACER COUNTIES

T. E. Connolly on January 4 suspended work for the winter on his grading contract between Airport and Indian Springs on the Dutch Flat-Donner Lake wagon road. The project covers the construction of 9.3 miles of 28-foot graded roadbed. Construction will be resumed as soon as weather conditions permit.

ORANGE COUNTY

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90- to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Macco Construction Co. When this work is completed the pavement will be 30 feet wide for the entire distance. It is expected that this work will be completed by next November.

SAN BENITO COUNTY

Plans are being prepared for the reconstruction of the state highway from a point three and one-half miles north of Hollister to the Pacheco Pass Lateral, a distance of about five miles. About two-thirds of a mile of this project is in Santa Clara County.

A survey for the relocation of the state highway between Salinas and San Juan Bautista has been ordered and work on this survey will start at once. This change is partly in Monterey County and partly in San Benito County.

SAN DIEGO COUNTY

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long

and is to be a 46-foot graded roadbed. It is expected that this contract will be completed by July 1, 1930.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. It is expected that this contract will be completed next June.

A contract for grading 2.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. This section is on the San Diego-El Centro Highway. Rough grading is completed and concrete paving is now in progress. It is expected that this contract will be finished by July 1, 1930.

A contract for grading a 38-foot roadbed between Miller Creek and Tecate Divide on the San Diego-El Centro Highway was awarded to Monarch & Breen on August 17, 1929. This work is rapidly nearing completion and should be finished by May 1, 1930.

SAN LUIS OBISPO COUNTY

Asphaltic concrete pavement 20 feet in width is being placed on the Coast Highway between Atascadero and Paso Robles. Steele Finley is the contractor. This work is expected to be finished in June.

Street improvements including a half-mile of state highway are being constructed in the town of Atascadero. This work is handled by a local improvement district. M. J. Bevanda is the contractor.

On the Coast Highway between the Santa Maria River and Los Berros Creek, a distance of 7.2 miles, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Grading on this contract is progressing at a rapid rate with two power shovels working two shifts. J. F. Knapp is the contractor.

Plans have been completed on the proposed reconstruction of the Coast Highway between San Luis Obispo and Cuesta Grade, a distance of about three miles.

SANTA BARBARA COUNTY

On the Coast Highway between Wigmore and Zaca, a distance of four miles, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Rough grading is well under way. The Cornwall Construction Company is the contractor.

Plans are complete for a change of line on the Coast Highway about two miles south of Buellton. This change will require a new bridge over Nojoqui Creek.

YOLO COUNTY

C. W. Wood, contractor, completed 1000 feet of Portland cement concrete pavement 20 feet wide at Mullen Crossing. The resulting construction improved the surface, alignment and grade for 500 feet each side of the Southern Pacific Railroad tracks.

The teacher asked little Abie to give a sentence using the word "diadem."

After much effort, Abie turned in the following: "People who drive onto railroad crossings without looking, diadem sight quicker than those who stop, look, and listen."—*Exchange*.

WATER APPLICATIONS AND PERMITS

Applications for Permit to Appropriate Water Filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1930.

TRINITY COUNTY—Application 6578. The New River Mining Co., Ltd, c/o H. W. Hall, Box M, Corona, for 40 c.f.s. from Quimby Creek tributary to New River to be diverted in Sec. 29, T. 7 N., R. 7 E., 11, M., for mining purposes. Estimated cost \$10,000.

YOLO COUNTY—Application 6579. Lars Jorgensen, Hobart Bldg., San Francisco, for 200 c.f.s., 100,000 acre-feet per annum from Putah, Pope, Capell, Elicura creeks tributary to Sacramento River to be diverted in Sec. 25, T. 8 N., R. 2 W., M. D. M., for domestic and industrial purposes. Estimated cost \$3,900,000.

TRINITY COUNTY—Application 6580. R. E. Roberts, Burnt Ranch, for 2 c.f.s. from Jan. 1st, to Dec. 31st, from Dixie Creek tributary to New River to be diverted in Sec. 2, T. 5 N., R. 6 E., H. B. and M., for mining and domestic purposes ($\frac{1}{2}$ acre domestic irrigation).

SUTTER COUNTY—Application 6581. Fred Holmes and R. E. Hughes, 41 Palm Ave., Woodland, for 10 c.f.s. from East Dredge Cut of Sutter By-pass tributary to Sacramento River to be diverted in Sec. 3, T. 12 N., R. 3 E., M. D. M., Sec. 19, T. 13 N., R. 3 E., M. D. M., for recreational purposes.

SUTTER COUNTY—Application 6582. C. Fred Holmes and R. E. Hughes, 41 Palm Ave., Woodland, for 42.26 c.f.s. from East Dredge Cut of Sutter By-pass tributary to Sacramento River to be diverted in Sec. 3, T. 12 N., R. 3 E., M. D. M., Sec. 19, T. 13 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$15,000.

SACRAMENTO COUNTY—Application 6583. A. L. White, Sacramento, for 2.5 c.f.s. from March 1st, to October 15th, of each season from Sacramento River to be diverted in Sec. 33, T. 10 N., R. 3 E., M. D. B. and M., for irrigation purposes. (80 acres.) Estimated cost \$2,000.

LOS ANGELES COUNTY—Application 6584. John J. Johnson, Sunland, for 0.25 c.f.s. from Jan. 1st, to Dec. 31st, from unnamed spring tributary to Los Angeles River watershed to be diverted in Sec. 2, T. 2 N., R. 14 W., S. B. M., for domestic and irrigation purposes. (83 acres.) Estimated cost \$1,500.

MONO COUNTY—Application 6585. Ralph B. Lloyd, Los Angeles, for 100,000 acre-feet per annum from East and West Walker River and Adobe Valley to be diverted in Sec. 14, 22, 27, 33, T. 6 N., R. 22 E., M. D. M., Sec. 33, 34, 35, T. 4 N., R. 25 E., M. D. M., for power purposes.

MONO COUNTY—Application 6586. Ralph B. Lloyd, Los Angeles, for 100,000 acre-feet per annum from East and West Walker River and Adobe Valley to be diverted in Sec. 14, 22, 27, 33, T. 6 N., R. 22 E., M. D. M., Sec. 33, 34, 35, T. 4 N., R. 25 E., M. D. M., for irrigation and domestic purposes on 50,000 acres.

CONTRA COSTA COUNTY—Application 6587. Henry R. Vail, c/o E. H. Frazier, 422 $\frac{1}{2}$ D St., Marysville, for 37 c.f.s. from Old River, Dredger Cut and Italian Slough tributary to San Joaquin River to be diverted in Sec. 13, T. 1 S., R. 3 E., M. D. M., Sec. 6, 7, 18, T. 1 S., R. 4 E., for irrigation purposes. Estimated cost \$10,000.

SAN JOAQUIN COUNTY—Application 6588. American Trust Co., a corporation, 461 California St., San Francisco, for 6 c.f.s. from Stanislaus tributary to San Joaquin River to be diverted in Sec. 21, T. 2 S., R. 8 E., M. D. M., for irrigation purposes. Estimated cost \$2,500.

VENTURA COUNTY—Application 6589. Julius Olender, 1812 Tulare St., Fresno, for 0.04 c.f.s. from unnamed spring tributary to In Piru Creek Watershed to be diverted in Sec. 25, T. 7 N., R. 19 W., S. B. M., for mining and domestic purposes. Estimated cost \$100.

PLUMAS COUNTY—Application 6590. Telluric Mining and Smelting Co., Seattle, Wash., for 0.10 c.f.s. from Jan. 1st, to Dec. 31st, from unnamed rivulet tributary to (In Indian Creek Drainage Area) to be diverted in Sec. 12, T. 26 N., R. 9 E., M. D. B. and M., for mining purposes. Estimated cost \$200.

MENDOCINO COUNTY—Application 6591. Hale Burger, Yorkville, for 50 acre-feet per annum from Rancheria Creek tributary to Navarro River to be diverted in Sec. 25, T. 13 N., R. 14 W., M. D. B. and M., for irrigation and domestic purposes (10 acres). Estimated cost \$1,000.

SAN BERNARDINO COUNTY—Application 6592. John M. Willoughby, 846 N. Hudson Ave., Los Angeles, for $\frac{1}{2}$ c.f.s. from unnamed spring tributary to Mojave Desert to be diverted in Sec. 15, T. 3 N., R. 1 W., S. B. R. and M., for domestic and irrigation purposes (40 acres). Estimated cost \$600.

SUTTER COUNTY—Application 6593. Estate of California E. Hale, c/o John E. Hale, Marysville, for 1.75 c.f.s. from Feather River tributary to Sacramento River to be diverted in Sec. 35, T. 15 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$4,200.

MENDOCINO COUNTY—Application 6594. Snow Mountain Water and Power Co., San Francisco, for 50 c.f.s., 14,500 acre-feet per annum, from South Eel River tributary to Eel River to be diverted in Sec. 30, T. 18 N., R. 11 W., M. D. M., for irrigation purposes on 4905.9 acres. Estimated cost \$2,000,000.

KERN COUNTY—Application 6595. Geo. O. H. Buchner, c/o Walter C. Hintze, 1051 Subway Terminal Bldg., Los Angeles, for 1 c.f.s. Jan. 1st, to Dec. 31st, of each season from well tributary to South Fork Rag Gulch to be diverted in Sec. 22, T. 26 S., R. 28 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$15,000.

TRINITY COUNTY—Application 6596. A. M. Knapp, Weaverville, for 80 c.f.s. from Big French Creek tributary to Trinity River to be diverted in Sec. 17, T. 5 N., R. 8 E., M. D. M., for mining purposes. Estimated cost \$20,000.

NEVADA COUNTY—Application 6597. South Yuba Co., Ltd., c/o W. E. Plank, Washington, Nevada Co., for 40 c.f.s. from Scotchman Creek tributary to South Fork of Yuba River to be diverted in Sec. 18, T. 17 N., R. 11 E., M. D. M., for mining purposes. Estimated cost \$2,200.

TRINITY COUNTY—Application 6598. Anton Weber, Trinity Alps, for 0.75 c.f.s. from Elk Gulch tributary to Stuarts Fork of Trinity River to be diverted in Sec. 21, T. 35 N., R. 9 W., M. D. B. and M., for irrigation purposes (60 acres).

INYO COUNTY—Application 6599. J. F. Chrysler and E. H. Cook, Lone Pine, for 1 c.f.s., March 1st, to Nov. 30th, of each season from Carroll Creek tributary to Owens Lake to be diverted in Sec. 31, T. 16 S., R. 36 E., M. D. M., for irrigation and recreational purposes (20 acres). Estimated cost \$300.

SIERRA COUNTY—Application 6600. E. A. Humphreys, c/o R. F. Taylor, Downieville, for 25 c.f.s. from South Fork of North Fork of Yuba River tributary to Yuba River to be diverted in Sec. 30, T. 20 N., R. 12 E., M. D. M., for mining purposes. Estimated cost \$5,000.

SANTA CLARA COUNTY—Application 6601. G. T. Letcher, c/o Louis Oneal, First National Bank Bldg., San Jose, for 45 acre-feet per annum, from unnamed spring to be diverted in Sec. 10, T. 7 S., R. 1 W., M. D. M., for irrigation and domestic purposes.

SAN LUIS OBISPO COUNTY—Application 6602. M. H. Stephens, San Luis Obispo, for total 480 gallons per day from 2 springs tributary to Day Creek to be diverted in Sec. 32, T. 32 S., R. 16 E., M. D. B. and M., for stock-watering purposes. Estimated cost \$400.

MERCED COUNTY—Application 6603. J. L. Firpo and John Caraglio, c/o Hugh K. Landram, Merced, for 4 c.f.s., April 1st, to Oct. 1st, of each season from Merced River tributary to San Joaquin River to be diverted in Sec. 35, T. 5 S., R. 12 E., M. D. B. and M., for irrigation purposes (329.7 acres). Estimated cost \$2,200.

LAKE COUNTY—Application 6604. Martin Judge, Jr. and Co., Crocker First National Bank Bldg., San Francisco, for 250 c.f.s., 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

LAKE COUNTY—Application 6605. Martin Judge Jr. and Co., Crocker First National Bank Bldg., San Francisco, for 175,000 acre feet per annum tributary to North Fork of Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation purposes. Estimated cost \$1,000,000.

SAN MATEO COUNTY—Application 6606. The Board of Trustees of the Leland Stanford Jr. University, A. F. Rath, Comptroller, Stanford University, Palo Alto, for 10 c.f.s., 5300 acre-feet per annum, from San Francisco Creek to be diverted in Sec. 17, T. 6 S., R. 3 W., M. D. M., for domestic purposes. Estimated cost \$350,000.

SAN MATEO COUNTY—Application 6607. The Board of Trustees of the Leland Stanford Jr. University, A. F. Rath, Comptroller, Stanford University, Palo Alto, for 30 c.f.s., 5300 acre-feet per annum from San Francisco Creek to be diverted in Sec. 17, T. 6 S., R. 3 W., M. D. M., for irrigation purposes. Estimated cost \$350,000.

PLACER COUNTY—Application 6608. Bear River Water and Power Co., c/o J. L. Rollins, Manager, Colfax, for 111,020 acre-feet per annum from Bear River and its tributaries tributary to Feather River to be diverted in Sec. 22, T. 15 N., R. 9 E., M. D. B. and M., for power purposes (4250 h.p.). Estimated cost about \$2,000,000.

DEL NORTE COUNTY—Application 6609. Geo. C. Walton, Crescent City, for 0.12 c.f.s., Jan. 1st, to Dec. 31st, from Rock Creek tributary to Smith River to be diverted in Sec. 4, T. 16 N., R. 1 E., H. M., for irrigation and domestic purposes (1½ acres). Estimated cost \$200.

SAN BERNARDINO COUNTY—Application 6610. Alvin W. Bercaw, 917 W. 35 St., Los Angeles, for 0.25 c.f.s., Jan. 1st, to Dec. 31st, of each season from 5 unnamed springs tributary to Mojave Desert to be diverted in Sec. 27, T. 4 N., R. 2 W., S. B. B. and M., for irrigation and domestic purposes (50 acres). Estimated cost \$1,500.

SAN DIEGO COUNTY—Application 6611. Ocean-side Mutual Water Co., c/o A. L. Sonderegger, 925

Central Bldg., Los Angeles, for 1000 acre-feet per annum from Calaveras Creek tributary to Agua Hedionda Creek to be diverted in Sec. 34, T. 11 S., R. 4 W., S. B. B. and M., for domestic and irrigation purposes.

SAN JOAQUIN COUNTY—Application 6612. F. J. Dietrich and Geo. W. Leistner and Geo. A. Ditz, c/o Neumiller and Ditz, 605 Bank of Italy Bldg., Stockton, for 1.44 c.f.s. from Calaveras River tributary to San Joaquin to be diverted in Sec. 27, T. 40 N., R. 6 E., M. D. B. and M., for irrigation purposes (115.46 acres).

SAN FRANCISCO COUNTY—Application 6613. L. F. Trumbull, 714 Sheldon Bldg., San Francisco, for 200 gallons per day from unnamed spring tributary to Lower Echo Lake to be diverted in Sec. 1, T. 11 N., R. 17 E., M. D. M., for domestic purposes.

MONO COUNTY—Application 6614. Lloyd Summers, Mammoth Lakes, for 0.68 c.f.s. from Lake Mary tributary to Mammoth Creek-Owens River to be diverted in Sec. 16, T. 4 S., R. 27 E., M. D. B. and M., for domestic purposes. Estimated cost \$4,000.

Permits to Appropriate Water issued by The Department of Public Works, Division of Water Resources, during the month of March, 1930.

SANTA CLARA COUNTY—Permit 3442, Application 6167. Issued to Ida M. McArthur et al. Cupertino, March 5, 1930, for 3 c.f.s. from Stevens Creek in Sec. 11, T. 7 S., R. 2 W., M. D. M., for irrigation on 144.9 acres. Estimated cost \$3,500.

SANTA CRUZ COUNTY—Permit 3443, Application 5990. Issued to Anna M. Werner, Santa Cruz, March 6, 1930, for 0.06 c.f.s. from Bean Creek in Sec. 13, T. 10 S., R. 2 W., M. D. M., for irrigation and domestic on 3 acres. Estimated cost \$450.

SANTA CRUZ COUNTY—Permit 3444, Application 4842. Issued to Forest Lake Mutual Water Company, San Francisco, March 6, 1930, for 0.6 c.f.s. from Gold Gulch and two unnamed tributaries in Sec. 29, T. 10 S., R. 2 W., M. D. M., for domestic use. Estimated cost \$10,000.

NEVADA COUNTY—Permit 3445, Application 6484. Issued to Siberia Mine, San Francisco, March 10, 1930, for 1 c.f.s. from Grizzly Creek in Sec. 36, T. 18 N., R. 8 E., M. D. M., for mining use. Estimated cost \$2,500.

PLUMAS COUNTY—Permit 3446, Application 6469. Issued to Henry Holley, Twain, March 10, 1930, for 0.014 c.f.s. from unnamed spring in Sec. 21, T. 25 N., R. 8 E., M. D. M., for domestic use. Estimated cost \$200.

LOS ANGELES COUNTY—Permit 3447, Application 6425. Issued to Joseph Argay, Mt. Wilson, March 12, 1930, for 50 acre-feet per annum from Coldwater Canyon Creek in Sec. 34, T. 3 N., R. 12 W., S. B. M., for mining use. Estimated cost \$2,500.

STANISLAUS COUNTY—Permit 3448, Application 6497. Issued to Alexander J. Silveria, Crows Landing, March 17, 1930, for 0.5 c.f.s. from San Joaquin River in Sec. 8, T. 6 S., R. 9 E., M. D. M., for irrigation on 40 acres. Estimated cost \$2,000.

DEL NORTE COUNTY—Permit 3449, Application 6503. Issued to C. R. Ward et al., Crescent City, March 17, 1930, for 0.15 c.f.s. from two unnamed creeks in Sec. 19, T. 17 N., R. 2 E., H. M., for domestic use. Estimated cost \$2,000.

SUTTER COUNTY—Permit 3450, Application 6504. Issued to Frank Berry, Yuba City, March 18, 1930, for 0.5 c.f.s. from Feather River in Sec. 4, T. 14 N., R. 3 E., M. D. M., for irrigation on 40 acres. Estimated cost \$1,100.

MENDOCINO COUNTY—Permit 3451, Application 6426. Issued to Neil G. MacKinnon, Cummings, March 18, 1930, for 26,000 gallons per day from Big Dan Creek in Sec. 12, T. 23 N., R. 17 W., M. D. M., for irrigation and domestic use on 16 acres. Estimated cost \$1,200.

AMADOR COUNTY—Permit 3452, Application 6032. Issued to Pacific Gas & Electric Company, San Francisco, March 24, 1930, for 200 c.f.s. and 50,000 acre-feet per annum from Bear River and Cold Creek in Secs. 19 and 28, T. 8 N., R. 16 E., M. D. M., for power purposes. Estimated cost \$7,000,000.

SUTTER COUNTY—Permit 3453, Application 6457. Issued to E. H. Christenson & Son, Yuba City, March 26, 1930, for 10,96 c.f.s. from East Dredge Cut of Sutter By-pass in Sec. 28, T. 13 N., R. 3 E., M. D. M., for irrigation on 438.68 acres. Estimated cost \$6,000.

LOS ANGELES COUNTY—Permit 3454, Application 1562. Issued to City of Pasadena Water Department, Pasadena, March 26, 1930, for 14.5 c.f.s. from Arroyo Seco in Sec. 5, T. 1 N., R. 12 W., S. B. M., for municipal purposes. Estimated cost \$290,000.

SUTTER COUNTY—Permit 3455, Application 6533. Issued to A. M. Donahoe, Yuba City, March 27, 1930, for 1 c.f.s. from Feather River in Sec. 14, T. 14 N., R. 3 E., M. D. M., for irrigation on 80 acres. Estimated cost \$2,500.

MERCED COUNTY—Permit 3456, Application 6470. Issued to San Joaquin Light & Power Corporation, Fresno, March 31, 1930, for 1750 c.f.s. from Merced River in Sec. 4, T. 5 N., R. 15 E., M. D. M., for power purposes. Estimated cost \$400,000.

SAN DIEGO COUNTY—Permit 3457, Application 6357. Issued to Edith Austin Ayres, San Diego, March 31, 1930, for 100,000 gallons per day from six springs unnamed in Secs. 29, 32 and 33, T. 12 S., R. 4 E., S. B. M., for domestic use. Estimated cost \$32,500.

DAM APPLICATIONS

APPROVALS

AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1930.

STANISLAUS COUNTY—Woodward Reservoir Dam No. 66. South San Joaquin Irrigation District, Manteca, owner; earthfill, 60 feet above streambed with a storage capacity of 35,000 acre-feet. Situated on main supply canal in Sec. 9, T. 1 S., R. 10 E., M. D. M., for storage and regulation purposes for irrigation use. Estimated cost \$225,000.

EL DORADO COUNTY—Williamson Dam No. 464. Hector Williamson, Placerville, owner; earth fill, 25 feet above streambed with a storage capacity of 92.4 acre-feet. Situated on an unnamed creek tributary to Webber Creek in Sec. 35, T. 11 N., R. 9 E., for storage purposes for irrigation use.

MARIPOSA COUNTY—Exchequer Dam No. 58-2. Merced Irrigation Company, Merced, owner; arch gravity, 288 feet above streambed with a storage capacity of 289,000 acre-feet. Situated on Merced River in Sec. 13, T. 4 S., R. 15 E., M. D. M., for storage purposes for irrigation and power use. Estimated cost \$5,116,073.

LOS ANGELES COUNTY—Twin Lakes Park

Lower Dam No. 774. Nelson A. Gray, Glendale, owner; concrete, 31 feet and five inches above streambed. Situated on Browns Canyon in Sec. 7, T. 2 N., R. 16 W., S. B. M., for diversion purposes for recreation use.

LOS ANGELES COUNTY—Twin Lakes Park Upper Dam No. 774-2. Twin Lakes Park Company, Los Angeles, owner; gravity, 24 feet above streambed. Situated on Devils Creek tributary to Aliso Canyon in Sec. 7, T. 2 N., R. 16 W., S. B. M., for diversion purposes for recreation use.

TUOLUMNE COUNTY—Don Pedro Dam No. 68. Turlock & Modesto Irrigation Districts, Turlock and Modesto, owners; gravity arch, 264 feet above streambed with a storage capacity of 289,000 acre-feet. Situated on Tuolumne River tributary to San Joaquin River in Sec. 35, T. 2 S., R. 14 E., M. D. M., for storage purposes, for irrigation and power use. Estimated cost \$3,097,419.

STANISLAUS COUNTY—La Grange Dam No. 68-2. Turlock & Modesto Irrigation Districts, Turlock and Modesto, owners; masonry, 129 feet above streambed with a storage capacity of 500 acre-feet. Situated on Tuolumne River tributary to San Joaquin River in Sec. 16, T. 3 S., R. 14 E., M. D. M., for diversion purposes for irrigation and power use. Estimated cost \$550,000.

STANISLAUS COUNTY—Owen Reservoir Dam No. 68-3. Turlock Irrigation District, Turlock, owner; buttress, 46 feet above streambed with a storage capacity of 49,000 acre-feet. Situated on Main Canal in Sec. 1, T. 4 S., R. 12 E., M. D. M., for regulation purposes for irrigation use. Estimated cost \$35,417.

LOS ANGELES COUNTY—Verdugo Road Dam No. 5-3. City of Glendale, Glendale, owner; earthfill, 23½ feet high with a storage capacity of 23 acre-feet. Situated on no stream for storage purposes for municipal use. Estimated cost \$60,800.

LOS ANGELES COUNTY—Tenth and Western Dam No. 5-4. City of Glendale, Glendale, owner; earthfill, 23½ feet high with a storage capacity of 46 acre-feet. Situated on no stream for storage purposes for municipal use. Estimated cost \$78,190.

LOS ANGELES COUNTY—Chevy Chase Dam No. 5-5. City of Glendale, Glendale, owner; earthfill, 24 feet high with a storage capacity of 46 acre-feet. Situated on no stream for storage purposes for municipal use. Estimated cost \$84,475.

MODOC COUNTY—Payne Dam No. 143. H. G. and R. A. Payne, Alturas, owners; earthfill, with a storage capacity of 2000 acre-feet. Situated on no stream tributary to the South Fork of Pit River in Sec. 15, T. 41 N., R. 13 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—Farad Dam No. 105. Sierra Pacific Power Company, Reno, Nevada, owner; crib, 8 feet above streambed. Situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. M., for diversion purposes for power use.

NEVADA COUNTY—Fleish Dam No. 105-2. Sierra Pacific Power Company, Reno, Nevada, owner; crib, 10 feet above streambed. Situated on Truckee River in Sec. 18, T. 18 N., R. 18 E., M. D. M., for diversion purposes for power use.

EL DORADO COUNTY—Loon Lake Dam No. 105-3. Sierra Pacific Power Company, Reno, Nevada, owner; gravity, 30 feet above streambed with a storage capacity of 8000 acre-feet. Situated on Gerle Creek tributary to Rubicon River in Sec. 4, T. 13 N., R. 15 E., M. D. M., for storage purposes for domestic and irrigation use.

RIVERSIDE COUNTY—Fishermans Retreat No. 1 Dam No. 811. D. Gerster, Redlands, owner; earthfill, 14 feet above streambed. Situated on San Timoteo Creek tributary to Santa Ana River in Sec. 28, T. 2 S., R. 2 W., S. B. M., for storage purposes for irrigation use.

RIVERSIDE COUNTY—Fishermans Retreat No. 2 Dam No. 811-2. D. Gerster, Redlands, owner; earthfill, 4 feet above streambed. Situated on San Timoteo Creek tributary to Santa Ana River in Sec. 28, T. 2 S., R. 2 W., S. B. M., for storage purposes, for irrigation use.

EL DORADO COUNTY—Webber Creek Dam No. 53. El Dorado Irrigation District, Placerville, owner; multiple arch, 85 feet above streambed with a storage capacity of 1275 acre-feet. Situated on Webber Creek tributary to South Fork American River in Sec. 18, T. 10 N., R. 12 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$180,000.

EL DORADO COUNTY—Blakely Dam No. 53-2. El Dorado Irrigation Company, Placerville, owner; earthfill, 20 feet above streambed with a storage capacity of 175 acre-feet. Located in Sec. 12, T. 10 N., R. 11 E., M. D. M., for regulating purposes for municipal use.

PLACER COUNTY—Morning Star Dam No. 325. McGeechin Placer Gold Mining Company, Sacramento, owner; earthfill, 40 feet above streambed with a storage capacity of 2200 acre-feet. Situated on Shirlatt Creek tributary to North Fork of American River in Sec. 17, T. 15 N., R. 11 E., M. D. M., for storage purposes for domestic, power and mining uses. Estimated cost \$50,000.

SAN BERNARDINO COUNTY—Chino Ranch No. 1 Dam No. 801. Scott Investment Company, Rowland & Chandis, Los Angeles, owners; earthfill, 14 feet above streambed. Situated on a branch of Brea Canyon in Sec. 13, T. 2 S., R. 9 W., S. B. M., for storage purposes for irrigation use.

SAN BERNARDINO COUNTY—Chino Ranch No. 2 Dam No. 801-2. Scott Investment Company, Rowland & Chandis, Los Angeles, owners; earthfill, 18 feet above streambed. Situated on branch of Brea Canyon in Sec. 13, T. 2 S., R. 9 W., S. B. M., for storage purposes for irrigation use.

SAN BERNARDINO COUNTY—Chino Ranch No. 3 Dam No. 801-3. Scott Investment Company, Rowland & Chandis, Los Angeles, owners; arch, 27 feet above streambed. Situated on branch of Brea Canyon in Sec. 13 S., T. 2 S., R. 9 W., S. B. M.

YUBA AND PLACER COUNTIES—Camp Far West Dam No. 52. Camp Far West Irrigation District, Wheatland, owner; gravity arch, 42 feet above streambed with a storage capacity of 5000 acre-feet. Situated on Bear River tributary to Feather River in Sec. 21, T. 14 N., R. 6 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$166,978.

NEVADA COUNTY—Bowman Diversion Dam No. 61. Nevada Irrigation District, Grass Valley, owner; arch, 21 feet above streambed. Situated on Canyon Creek tributary to South Yuba River in Sec. 8, T. 18 N., R. 12 E., M. D. M., for diversion purposes for irrigation and other uses.

PLUMAS COUNTY—Feather River Improvement Dam No. 282. Feather River Improvement Company, Blairsden, owner; rockfill, 10 feet high with a storage capacity of 150 acre-feet. Situated on no stream tributary to Feather River in Sec. 7, T. 22 N., R. 12 E., M. D. M., for storage purposes for irrigation use.

SANTA CLARA COUNTY—Grant Company No. 1 Dam No. 621. Grant Company, San Francisco, owner; earthfill, 22 feet above streambed with a stor-

age capacity of 25 acre-feet. Situated on Arroyo Aguagne, tributary to Penitencia Creek located in Rancho Canada de Pala for Diversion purposes for irrigation use. Estimated cost \$6,000.

SANTA CLARA COUNTY—Grant Company No. 2 Dam No. 621-2. Grant Company, San Francisco, owner; earthfill, 14 feet above streambed with a storage capacity of 180 acre-feet. Situated on Arroyo Aguagne tributary to Penitencia Creek located in Rancho Canada de Pala for storage purposes for irrigation use. Estimated cost \$2,000.

SIERRA COUNTY—Webber Lake Dam No. 295. Hobart Estate Company, Hobart Mills, owner; wood. Situated on Little Truckee River tributary to Truckee River in Sec. 28, T. 19 N., R. 14 E., M. D. M., for storage purposes for recreation use.

SIERRA COUNTY—Independence Lake Dam No. 295-2. Hobart Estate Company, Hobart Mills, owner; wood. Situated on Independence Lake tributary to Little Truckee River in Sec. 34, T. 19 N., R. 15 E., M. D. M.

LAKE COUNTY—Bucksnot Dam No. 392. Estate of W. F. Detert, San Francisco, owner; earthfill, 30 feet above streambed with a storage capacity of 1000 acre-feet. Situated on Bucksnot Creek tributary to Pintah Creek in Sec. 9, T. 10 N., R. 6 W., M. D. M., for storage purposes for irrigation use. Estimated cost \$100,000.

AMADOR COUNTY—Central Eureka Dam No. 476. Central Eureka Mining Company, Sutter Creek, owner; earthfill, 17 feet above streambed with a storage capacity of 10 acre-feet. Situated on Anderson Gulch tributary to Sutter Creek in Sec. 7, T. 6 N., R. 12 E., M. D. M., for storage purposes for irrigation and debris use.

SAN BERNARDINO COUNTY—Arrow Bear Dam No. 807. Arrow Bear Lake Company, Los Angeles, owner; gravity, 10 feet above streambed. Situated on South Fork of Deep Creek tributary to Deep Creek for storage purposes for recreation use. Estimated cost \$5,000.

SISKIYOU COUNTY—Pruett Dam No. 184. R. H. Pruett, Yreka, owner; earthfill, 20 feet above streambed for storage purposes for domestic use.

LASSEN COUNTY—Triplet Dam No. 247. James Olsen, Madeline, owner; earthfill, with a storage capacity of 40 acre-feet. Situated on hill watershed in Sec. 23, T. 37 N., R. 13 E., M. D. M., for storage purposes for irrigation use.

TEHAMA COUNTY—Dunn Ranch Dam No. 261-2. C. Fred Holmes, Gerber, owner; earthfill, 31 feet above streambed with a storage capacity of 115 acre-feet. Situated on Dry Gulch tributary to Sacramento River in T. 25 N., R. 2 W., M. D. M., for storage purposes for stock watering use.

LOS ANGELES COUNTY—Malibu Dam No. 773. Marblehead Land Company, Los Angeles, owner; concrete, 102 feet above streambed with a storage capacity of 574 acre-feet. Situated on Malibu Creek in Sec. 19, T. 1 S., R. 17 W., S. B. M., for storage purposes for irrigation and domestic use. Estimated cost \$152,927.59.

MODOC COUNTY—James Flat Dam No. 121. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earthfill, 14 feet above streambed with a storage capacity of 1408 acre-feet. Situated on Mosquito Creek tributary to Willow Creek in Sec. 25, T. 47 N., R. 10 E., M. D. M., for diversion and storage purposes for irrigation use. Estimated cost \$7,500.

MODOC COUNTY—Antelope Dam No. 121-3. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earthfill, 10 feet above streambed with a storage

capacity of 1550 acre-feet. Situated on South End of Antelope Plains tributary to Clover Swale and Pit River in Sec. 11, T. 43 N., R. 10 E., M. D. M., for diversion and storage purposes for irrigation use. Estimated cost \$3,500.

RIVERSIDE COUNTY—Holmes Dam No. 1 No. S16. Lawrence Holmes, Arlington, owner; concrete, 27 feet above streambed with a storage capacity of 65 acre-feet. Situated on Cajolca Canyon tributary to Tamaseal Canyon in Sec. 12, T. 4 S., R. 6 W., S. B. M., for storage purposes for irrigation use. Estimated cost \$20,000.

NEVADA COUNTY—Lake Vera Dam No. 303. W. H. Griffith, Nevada City, owner; buttress, 16 feet above streambed with a storage capacity of 136.24 acre-feet. Situated on Rock Creek tributary to South Yuba River in Sec. 25, T. 1 N., R. 9 W., M. D. M., for storage purposes for recreation use. Estimated cost \$4,000.

ALAMEDA COUNTY—Central Reservoir Dam No. 31. East Bay Municipal Utility District, Oakland, owner; earthen, 50 feet high with a storage capacity of 485 acre-feet. Situated on Hopkins street and 23d avenue for storage purposes for domestic use.

ALAMEDA COUNTY—Berryman Reservoir Dam No. 31-S. East Bay Municipal Utility District, Oakland, owner; earthen, 40 feet high with a storage capacity of 69 acre-feet. Situated on Euclid avenue, north of Rose street, Berkeley, for storage purposes for municipal use.

ALAMEDA COUNTY—Piedmont No. 1 Reservoir Dam No. 31-10. East Bay Municipal Utility District, Oakland, owner; earthen, 50 feet high with a storage capacity of 33.76 acre-feet. Situated on Bullard Drive and Estates Drive, Piedmont, for storage purposes for municipal use.

ALAMEDA COUNTY—Claremont Reservoir Dam No. 31-9. East Bay Municipal Utility District, Oakland, owner; earthen, 17 feet high with a storage capacity of 25.16 acre-feet. Situated at Claremont avenue and Webster street, Berkeley, for storage purposes for municipal use.

ALAMEDA COUNTY—Piedmont No. 2, Reservoir Dam No. 31-11. East Bay Municipal Utility District, Oakland, owner; earthen, 50 feet high with a storage capacity of 59.8 acre-feet. Situated at Scenic and Mulberry streets, Piedmont, for storage purposes for municipal use.

CONTRA COSTA COUNTY—Summit Reservoir Dam No. 31-42. East Bay Municipal Utility District, Oakland, owner; earthen, 21 feet high with a storage capacity of 116.6 acre-feet. Situated on Spruce street for storage purposes for municipal use.

ALAMEDA COUNTY—30th Avenue Reservoir Dam No. 31-13. East Bay Municipal Utility District, Oakland, owner; earthen, 16 feet high with a storage capacity of 32.91 acre-feet. Situated at head of Maybelle avenue, Oakland, for storage purposes for municipal use.

MODOC COUNTY—French Dam No. 143-2. G. P. French, Alturas, owner; gate, 7 feet above streambed. Situated on Inland Basin in Sec. 21, T. 41 N., R. 13 E., M. D. M., for storage purposes for stock and irrigation use.

AMADOR COUNTY—Sutter Creek Flushing Dam No. 13. City of Sutter Creek, Sutter Creek, owner; concrete, 14 feet above streambed with a storage capacity of 10 acre-feet. Situated on Sutter Creek in Sec. S, T. 6 N., R. 11 E., M. D. M., for storage purposes for flushing use. Estimated cost \$2,000.

MODOC COUNTY—Round Valley Dam No. 145-S. G. O. Trauzettal, Alturas, owner; earth and rockfill,

8 feet above streambed. Situated on Round Valley tributary to Triangle in Sec. S, T. 44 N., R. 44 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—Liberty Hill Dam No. 307. Wm. Maguire and Wm. Nicholls, Jr., Nevada City, owners; earthen, 50 feet above streambed. Situated on Bear River tributary to Feather River in Sec. 27, T. 15 N., R. 10 E., M. D. M., for storage purposes for debris use.

LASSEN COUNTY—Laxalt Dam No. 248. Peter Laxalt, Madeline, owner; earthen, 20 feet above streambed with a storage capacity of 50 acre-feet. Situated on McDonald Creek for storage purposes for irrigation and stock use.

RIVERSIDE COUNTY—Liberty Ranch Dam No. 821. C. E. Foxley, Romoland, owner; earthen, 16 feet above streambed with a storage capacity of 200 acre-feet. Situated on Salt Creek in Sec. 5, T. 6 S., R. 3 W., S. B. M., for storage purposes, for irrigation use. Estimated cost \$3,500.

SAN BERNARDINO COUNTY—Green Valley Dam No. 804. De Witt-Bair Realty Company, Los Angeles, owner; multiple arch, 60 feet above streambed with a storage capacity of 250 acre-feet. Situated on Green Valley Creek tributary to Deep Creek in Sec. 22, T. 2 N., R. 2 W., for storage purposes for recreation use. Estimated cost \$60,000.

AMADOR COUNTY—Treasure Debris Dam No. 473. Treasure Mining Company, San Francisco, owner; arch, 28 feet above streambed with a storage capacity of 0 acre-feet. Situated on Rancheria Creek tributary to Mokelumne River in Sec. 36, T. 7 N., R. 10 E., M. D. M., for storage purposes for debris use.

FRESNO AND MADERA COUNTIES—Mendota Dam No. 683. San Joaquin & Kings River Canal and Irrigation Company, Inc., San Francisco, owner; concrete, 17 feet above streambed with a storage capacity of 3000 acre-feet. Situated on San Joaquin River in Sec. 19, T. 13 S., R. 15 E., M. D. M., for diversion purposes for irrigation use.

FRESNO COUNTY—Sequoia Lake Dam No. 693. Sequoia Lake Conference, Y. M. C. A., Fresno, owner; rockfill, 47 feet above streambed with a storage capacity of 3000 acre-feet. Situated on Mill Flat Creek tributary to Kings River in Sec. 1, T. 14 S., R. 27 E., M. D. M., for storage purposes for recreation use.

CONTRA COSTA COUNTY—Mt. Diablo Dam No. 583. Mt. Diablo Country Club, Diablo, owner; earthen, 15 feet above streambed with a storage capacity of 95 acre-feet. Situated on Green Valley tributary to San Ramon Creek in Sec. 21, T. 1 S., R. 1 W., M. D. M., for storage purposes for recreation use.

CONTRA COSTA COUNTY—Black Hills Dam No. 583-2. Mt. Diablo Country Club, Diablo, owner; earthen, 38 feet above streambed with a storage capacity of 27 acre-feet. Situated on an unnamed creek tributary to Green Valley Creek in Sec. 14, T. 1 S., R. 1 W., M. D. M., for storage purposes for recreation use.

LOS ANGELES COUNTY—Little Rock Dam No. 57. Little Rock & Palmdale Irrigation District, Little Rock and Palmdale, owners; multiple arch, with a storage capacity of 5400 acre-feet. Situated on Little Rock Creek in Sec. 27, T. 5 N., R. 11 W., S. B. M., for diversion and storage purposes for irrigation use.

SAN BERNARDINO COUNTY—Wiggins Hill Dam No. 17. City of San Bernardino, San Bernardino, owner; earthen, 15.6 feet above streambed with a storage capacity of 36.8 acre-feet. Situated on Devil Canyon tributary to Santa Ana River for diversion purposes for municipal use. Estimated cost \$6,000.

SANTA CRUZ COUNTY—Boyea Creek Dam No. 96. Coast Counties Gas & Electric Company, Santa Cruz, owner; timber, 13 feet above streambed with a storage capacity of 50 acre-feet. Situated on Boyea Creek tributary to Big Creek in Sec. 5, T. 10 S., R. 3 W., M. D. M., for storage purposes for power use.

SANTA CRUZ COUNTY—Mill Creek Dam No. 96-2. Coast Counties Gas & Electric Company, Santa Cruz, owner; rock crib, 50 feet above streambed with a storage capacity of 350 acre-feet. Situated on Mill Creek tributary to Scotts Creek in Sec. 29, T. 9 S., R. 3 W., M. D. M., for storage purposes for power use.

YUBA COUNTY—Boyer Dam No. 61-11. Nevada Irrigation District, Grass Valley, owner; earthfill, 20 feet high with a storage capacity of 50 acre-feet. Situated on Excelsior Ditch in Sec. 2, T. 15 N., R. 6 E., M. D. M., for regulation purposes for irrigation use.

PLUMAS COUNTY—Tailings Dam No. 271. Walker Mining Company, Spring Garden, owner; earthfill, 25 feet above streambed with a storage capacity of 57 acre-feet. Situated on Little Grizzly Creek tributary to Indian Creek in Sec. 12, T. 24 N., R. 11 E., M. D. M., for storage purposes for debris use. Estimated cost \$38,000.

RIVERSIDE COUNTY—Holmes Upper Dam No. 816-2. Lawrence Holmes, Arlington, owner; reinforced concrete, 18 feet above streambed with a storage capacity of 50 acre-feet. Situated on Cajolea Canyon tributary to Tamascal Creek for storage purposes for irrigation use.

PLUMAS COUNTY—Australia Dam No. 275. Australia Placer Mining Company, Quincy, owner; earthfill. Situated on Waupensie Creek tributary to Spanish Creek for storage purposes for debris use.

MONO COUNTY—Walker Lake Dam No. 533. Farrington Estate, Mono Lake, owner; earth and rockfill; 6 feet above streambed with a storage capacity of 597 acre-feet. Situated on Walker Lake tributary to Mono Lake in Sec. 7, T. 1 S., R. 26 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$2,000.

MONO COUNTY—Sardine Lake Dam No. 533-2. Farrington Estate, Mono Lake, owner; rockfill, 10 feet above streambed with a storage capacity of 305 acre-feet. Situated on Sardine Lake tributary to Walker Creek and Mono Lake in Sec. 15, T. 1 S., R. 25 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$500.

NEVADA COUNTY—Omega Dam No. 302. South Yuba Mining & Development Company, San Francisco, owner; arch, 54 feet above streambed. Situated on Scotchman Creek tributary to South Yuba River for storage purposes for debris use. Estimated cost \$13,000.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1930.

BUTE COUNTY—Lake Madrone Dam No. 342. George Mansfield and Duncan McCallum, Oroville, owners; Ambursen, 27 feet above streambed. Situated on Berry Creek tributary to Feather River in Sec. 27, T. 21 N., R. 5 E., M. D. M., for storage purposes for recreation use. Estimated cost \$20,000. Fees paid \$200.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division

of Water Resources, during the month of March, 1930.

EL DORADO COUNTY—Rupley Dam No. 463. A. J. Rupley, Placerville, owner; earthfill. Situated on Webber Creek tributary to American River in Sec. 11, T. 11, R. 11.

SAN BERNARDINO COUNTY—Arrow-Bear Dam No. 807. Arrow-Bear Lake Corporation, Los Angeles, owner; gravity. Situated on South Fork of Deep Creek tributary to Deep Creek.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of March, 1930.

LOS ANGELES COUNTY—Glendale Park Manor Dam No. 5-2. City of Glendale, Glendale, owner; earthfill, 270 feet high with a storage capacity of 10.7 acre-feet. Situated on no stream for storage purposes for municipal use. Estimated cost \$49,300. Total.

CONTRA COSTA COUNTY—Chenery Dam No. 581. California Water Service Company, San Francisco, owner; earthfill, 30.5 feet above streambed with a storage capacity of 3113 acre-feet. Situated on no stream tributary to Sacramento River for storage purposes for industrial and domestic use. Estimated cost \$300,000.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of March, 1930.

MARIN COUNTY—Belvedere Dam No. 33-4. Marin Municipal Utility District, San Rafael, owner; earthfill. Nature of Repairs—Installing new outlet pipe.

LOS ANGELES COUNTY—Malibon Lake Dam No. 771. Malibon Lake Mountain Club, Los Angeles, owner; arch. Situated on Malibon Creek in Sec. 12, T. 1 S., R. 18 W., S. B. M.

SEATTLE PUBLIC LIBRARY

MOUNTAINS

By HARRY T. FEE.

Don't care much for valleys,
Don't banker much for seas,
But I'm crazy about mountains
All carpeted with trees.

Where the songs of birds and branches
Meet the singing of a stream,
And the sun is just a gleaming
Like the rapture of a dream.

There's a lot o' pretty scenery
In this old world as a whole,
But it's only in the mountains,
I seem to lose my soul.

They're prettier than roses,
Or springtime daffodils,
Oh—I'm crazy about mountains—
I'm daffy about hills.

And though I count the glory
Of each supernal world—
The drama of song and story
Which history has unfurled,

There's nothing in creation
To me so set apart,
As this beauty of the mountains
That sits upon my heart.

STATE OF CALIFORNIA Department of Public Works

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STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



Official Journal of the Department of Public Works
State of California

MAY

1930

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The Maximum Conservation of Water With Reference to the California Plan

By EDWARD HYATT, State Engineer

WATER is indispensable to human existence and in a large section of the world is the limiting natural resource; that is, the extent to which life can be sustained is or will be determined by the amount of usable water. It follows that in such localities the most complete possible use of the supply provided by nature is of vital importance, and does at the present time or will in the future transcend all other factors.

Where water occurs plentifully with respect to human needs a region is denoted humid and where insufficient, arid, with an intermediate and more or less indeterminate classification of semiarid. Under these criteria eastern United States is termed humid and the western part arid or semiarid, the dividing line being approximately at the 99th meridian, which passes somewhat west of the center of Kansas. The state of Kansas has made allowance for the dissimilar water supply conditions within its borders by enacting a different water code for the area west of the 99th meridian from that in force in the eastern half of the state.

The seventeen states lying partly or wholly west of the 99th meridian have, therefore, come to be considered the arid or irrigation states, which include North and South Dakota, Kansas, Nebraska, Oklahoma, Texas and all states west of those named. An association of the State Engineers of these seventeen irrigation states is actively functioning on matters pertaining to water, water rights, irrigation, reclamation and similar items of common interest. These so-called arid states include 60 per cent of the land area of the United States, 50 per cent of the farm lands and 91 per cent of the total irrigated area, as well as 19 per cent of the total popu-

lation and 24 per cent of the farm population of the country.

By reason of scarcity of supply, the problem of water conservation assumes a more compelling aspect in the west than in eastern or middle western United States, and the greatest progress looking toward its complete use has been made in the arid states. This discussion will deal mainly with conservation accomplishment and future plans in the

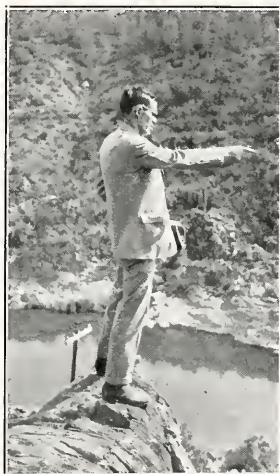
west and be illustrated by investigations under way in California, which has gone the farthest in the way of state-wide water plans. However, it is thought that the principles and methods hereinafter enumerated will in large degree be applicable to similar studies and development in other parts of the United States.

If maximum conservation is to be achieved, it naturally follows that the most complete possible utility must be made of existing water supplies for all useful purposes. Before approaching the purely technical phase of the study, therefore, the engineer should have a clear conception of fundamental consideration such as all present and future beneficial uses of water in the region under investigation, their

relative importance and amount, whether consumptive or nonconsumptive, degree of interference one with another, and legal or commonly accepted priorities, if any.

There are many and varied uses to be considered in a conservation program, including methods of regulation to prevent damage by water itself, such as flood control, which is usually so important in any study that for the purposes of the investigation it is considered a use. The known services fall into some five general classes as follows:

First—Consumptive, which includes municipal,



EDWARD HYATT, State Engineer.

stock, industrial, irrigation and some forms of mining and milling.

Second—The extraction of energy inherent in water by reason of its relative elevation, in which class are hydro power, including both hydroelectric and hydromechanical, and hydraulic and some other forms of mining.

Third—Use of the buoyancy of water for transportation purposes, consisting of all forms of navigation.

Fourth—Its utility as a scenic attraction and by reason of fish life maintained. This class consists of recreation and commercial fishing.

Fifth—The control of water to prevent damage; flood regulation, salinity control, and drainage. Salinity control, perhaps peculiar to California, consists in furnishing fresh water to hold back saline encroachment from the ocean and bays. Drainage is a concomitant of irrigation or of farming wet lands.

The thirteen uses listed may not all occur in a given region or state, however, they all do exist in California. Interference between different types may exist as between hydro power and irrigation, or navigation and other purposes, and must be taken into account.

The relative legal position of the divergent uses should also be known. On navigable streams and lakes the paramount right of the United States to regulate in the interest of navigation is unquestioned.

Subject to the superior right of the United States in the interest of navigation, most of the western states have by statute or administrative rule recognized certain relative priorities of water rights. Ten states have covered this by law. Domestic and municipal purposes are always first, irrigation generally second and other uses third, although in some cases stock watering comes in class one or two, and in one state mining is in class two under certain conditions. The Colorado River compact between the seven states comprising the drainage basin of that river, defines "domestic use" as including household, stock, municipal, mining, milling, industrial and other like purposes, but excludes the generation of electrical power.

The first step toward designing a solution of the problem is the collection and analysis of the engineering data, the critical feature of which is the water supply. From existing streamflow and rainfall data extended in time and location by standard engineering methods, an estimate of the location, amount and method of occurrence of the total water crop is obtained. In nearly all instances it is found that the bulk of the water occurs at a different time of year from the season of greatest use, therefore conservation inevitably hinges on storage, both seasonal and cyclic. Reservoir sites are often, if not usually, the controlling item in the conservation of a

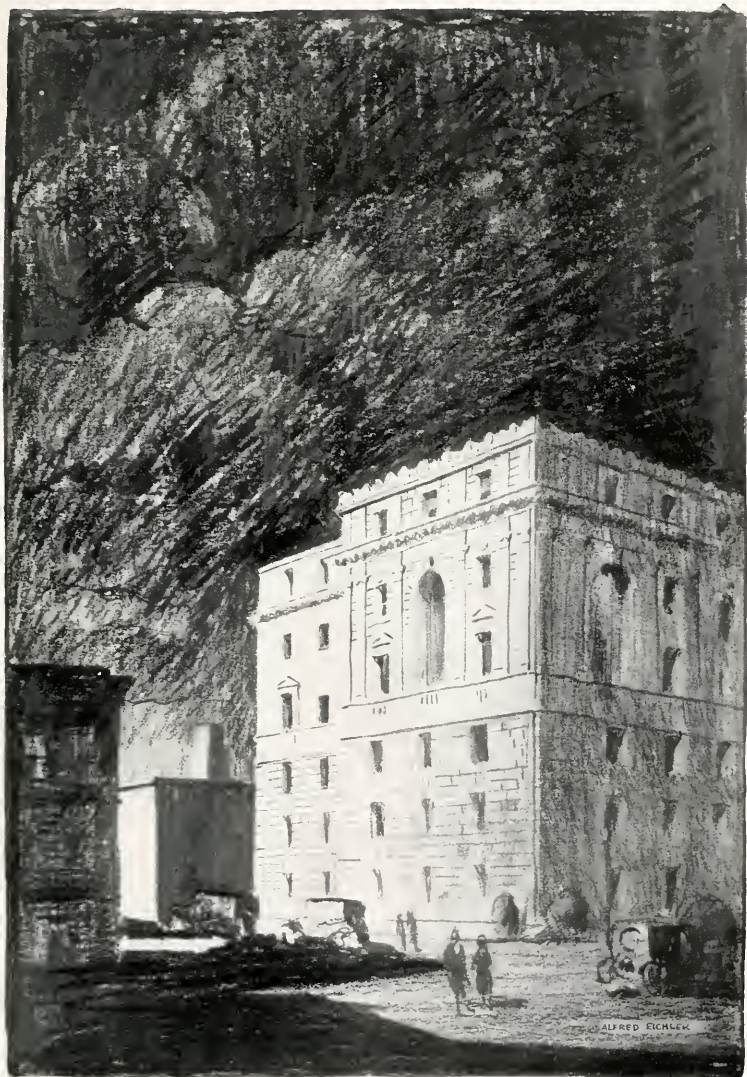
stream's waters. Therefore, reservoir sites are located and searchingly analyzed as to adequacy, cost and yields through the dry cycles which will determine the economic size and yield. It is not generally possible to capture for use more than 60 to 80 per cent of the mean discharge of a stream, even with unlimited reservoir capacity, which is often further limited by lack of favorable dam and reservoir sites.

The question of adequacy of sites for dams of great height and large storage capacity is assuming more and more importance and is leading to the enactment of laws requiring state supervision of dams in the interest of safety. This is a necessary step in order to reassure the public as regards the building of these structures of great potential danger and thus clear the way for the conservation program.

Concurrently with the water supply investigation a thorough study of present and future water needs should be carried out, which will include all of the uses heretofore listed in so far as they exist in the region under investigation. In irrigation states, such as California, over 90 per cent of the water consumptively used is for irrigation. It follows, therefore, that any development program in an arid state will revolve mainly around irrigation, giving due consideration, however, to all other purposes. A determination should be made of the arable lands of the state and of the amounts of water needed for their proper cultivation. This requires a classification of all such lands, which, while necessarily of a reconnaissance nature, is based upon soil, topography, climate, location and upon economic factors.

Knowing the amount, location and feasible yield of the total water supplies, the present usage being made therefrom; the amount, location and irrigation needs present and future of the arable lands, and the similar demands for other purposes, physical data is available for trial studies which will result in a comprehensive plan for utilization. Usually it will be found that the water is furnished by nature not only irregularly as to time, but also irregularly as to location. In other words, some areas will possess a surplus over and above their present and future needs and others be deficient either now or for future development. This inequality of location is in fact, one of the principal reasons why state direction and planning are necessary for if there were sufficient water for all purposes private development could proceed in accordance with economic laws, or if the

(Continued on page 17.)

Scenic Glimpses of State Buildings

View of the annex to the State Building at the Civic Center in San Francisco.

Construction Records Made During 1929

On California State Highway System

By EARL WITTHYCOMBE, Assistant Construction Engineer

AN ANALYSIS of the construction jobs on the California state highway system reveals in an interesting manner the progress that is being made in building better highways in this state. The following are outstanding facts and records that tell the story of construction progress during 1929:

PORTLAND CEMENT CONCRETE

Record for smoothness—Resident Engineer, C. N. Ainley; contractor, Griffith Co.; between Santa Ana and Anaheim in Orange County.

Record for average concrete strength—Resident Engineer, H. B. Lindley; contractor, Matich Bros.; line change west of San Clemente in Orange County.

Record for cement control—Resident Engineer, F. R. Baker; contractor, T. M. Morgan; between Shasta River and Gazelle in Siskiyou County.

Record for daily yardage—Resident Engineer, C. A. Potter; contractor, Fredrickson & Watson; between Ben Ali and Sylvan School in Sacramento County.

ASPHALTIC CONCRETE

Record for smoothness—Resident Engineer, C. T. Schultz; contractor, Peninsula Paving Co.; between Chualar and Salinas in Monterey County.

Record for best hand finished job—Resident Engineer, M. C. Fosgate; contractor, Hollywood Paving Co.; between Alto and Sausalito in Marin County.

Record for density of pavement surface—Resident Engineer, C. T. Schultz; contractor, Sam Hunter; between Stony Creek and Tecolote Creek in Santa Barbara County.

Record for stability of pavement surface—Resident Engineer, M. C. Fosgate; contractor, Hollywood Paving Co.; between Alto and Sausalito in Marin County.

Record of production—Resident Engineer, C. T. Schultz; contractor, Peninsula Paving Co.; between Chualar and Salinas in Monterey County.

SUMMARY OF 1929 PAVEMENT CONSTRUCTION

Riding quality was improved on both types of hard surface pavements over that of the previous year.

The outstanding accomplishments of the season's work were the reduction in roughness and the increase in average daily production of both portland cement concrete and asphaltic concrete mixtures.

The best machine finished asphaltic concrete project averaged but three and one-half inches of roughness per mile greater than the best portland cement concrete project.

The record average daily production of portland cement concrete pavement has been increased to 361.6 cubic yards. This figure is obtained by considering each start of the mixer as a day's run and represents approximately 90.4 per cent of the maximum output that could have been secured had there been no delays.

The high daily average of asphaltic concrete tonnage has been increased to 790.7 which represents 72 per cent of the maximum obtainable without delays.

PORTLAND CEMENT CONCRETE PAVEMENTS

Mix.—The maximum density method of proportioning coarse aggregate with the amount of fine aggregate governed by the resulting voids in the coarse aggregate and with a definite amount of excess for workability, constitutes the method of design of mixtures. The amount of cement is held uniformly to six sacks per cubic yard of concrete actually placed. As an experimental section, a day's run of concrete on one of the larger jobs of last season's construction was proportioned with but 4.83 sacks of cement to the cubic yard in an attempt to produce a compressive strength of 3500 pounds per square inch at 28 days.

The average for a series of casts made from this mix was 3630 pounds or 84.4 per cent of that produced from the same job with six sacks of cement to the cubic yard.

Design.—Panels are uniformly 10 by 20 feet with thickened longitudinal edges. Provision for expansion is made at 60-foot intervals and under special conditions at 40 feet. The intermediate joints are of the weakened plane type. A double line of one-half inch square deformed marginal bars is placed around all sides of the panel and held in place, four inches from the edge, by steel chairs driven into the subgrade. One end of all longitudinal steel is extended through the joint and fitted with a sleeve to serve as a dowel. Three additional three-quarter-inch round dowels are provided at expansion joints with provision for expansion at the ends of the dowels and the steel.

Construction.—Central proportioning by weighing each of the coarser aggregates, above and below the one and one-half-inch screen size, and the sand in separate boxes was uniformly practiced during the past season.

All construction was in 10-foot widths with the exception of one project where, for the convenience of traffic, 20-foot construction was permitted with a weakened plane longitudinal joint. The slab was poured from the side with an extension boom on the mixer.

It was definitely proven in last season's construction that delayed finish resulted in smoother riding surfaces, and this is being practiced on all subsequent work. Nearly all jobs have increased production to the point where two finishing machines or two heavy longitudinal floats are necessary in order to secure compaction, and delayed finish is secured by maintaining the maximum interval between the two machines or the floats, as the case may be.

Pavements are opened to traffic, following an 8-day watering period, on the basis of strengths developed by beams cast and broken in the field.

Result of Tests.—The average compressive strength of pavement concrete during 1929 for the entire state was 3630 pounds per square inch. This represents 24 projects. Of these 24 projects, 17 were selected by headquarters representatives to cast a special series of 10 to 15 cylinders for 28-day comparisons. The average strength from the job cylinders for these projects was 3940 pounds per square inch, as compared to 4365 pounds average on the basis of the casts made by headquarters.

Of the jobs selected for casting by headquarters, seven were selected by the laboratory for coring. The laboratory cores, after being corrected for height and age, show an average compressive strength of 4894 pounds per square inch, the corresponding headquarters casts show 4401 pounds, and the field casts show 3848 pounds per square inch. Assuming that the cores represent the true strength of the concrete in the pavement it would appear from this analysis that the headquarters casts represent but 90 per cent of the actual strength of the concrete and the field casts, but 79 per cent.

In the past it has been the practice to include in the 6-inch by 12-inch cylindrical cast a true representation of all the aggregate contained in the pavement mixture. It was questionable whether the maximum size aggregate, two and one-half-inch material, did not unduly influence the resulting strength in a cylinder of such dimensions, and it was later proven by our own investigations that such was the case. It then became a question as to the advisability of increasing the dimensions of the specimen to take care of the maximum size of rock or uniformly eliminating from the material selected for casting, all of the aggregate above a certain screen size. To increase the size of cylinders would have resulted in discarding a considerable portion of our field and laboratory equipment. It has been decided to screen the mixture on a one and one-half-inch square mesh prior to casting in order to secure uniformity. The early results from this method are exceptionally encouraging.

ASPHALTIC CONCRETE

Mix.—Since the latter part of the 1929 construction season mixtures are being designed and controlled by means of the stability test of the mortar content. The fine aggregate for a project is selected prior to the letting of the contract by means of relative stability values and often a convenient source of sand that would otherwise be rejected on the basis of specification requirements for sieve analysis is accepted if these stability values are satisfactory. This method has resulted in a wider use of local materials with a consequent greater economy in the price per ton of the mixtures in place.

Samples are taken at two-hour intervals during the operation of the plant, screened through the 10-mesh sieve while yet warm and submitted daily to the laboratory for a stability test. A rational use of this stability value is attempted at all times. Realizing the danger of sacrificing the qualities in the resulting pavement that prolong its useful life, no attempt is made to secure unreasonably high stability values.

Imported filler is not used in either base or leveling course mixtures but is maintained at approximately 8 per cent of the total dry mixture for the surface course.

Design.—Black base construction, on new subgrade, has come into more general use during the past season. Base course varies from four to five inches in center thickness, according to local conditions, and surface course is uniformly two inches in thickness over the full width. The outer edges of the pavement are uniformly thickened to nine inches corresponding to the portland cement concrete section. A subbase of natural cementing material is used under the pavement where local soil conditions are unfavorable for subgrade.

Construction.—Some hand finish was permitted on work during the past season but this type is rapidly being abandoned for the superior machine-finished work.

Mixing plants are now being manufactured and in use on state work with a capacity of nearly three

times that of the plants in general use a few years ago. The use of such plants has been made possible largely by the increase in capacity for handling tonnage on the street with machine methods. These plants have not as yet been brought up to their normal capacity for the duration of the job, but the delays can be attributed largely to the plant rather than to street operations. The maximum tonnage secured in eight hours on state work to date is slightly more than 1100 tons.

TABLES

The usual yearly summary of the hard surface pavements is tabulated by types for the entire state and includes all projects constructed during the 1929 season. A yearly comparison by districts of hard surface pavements is tabulated with comparisons of state averages.

Roughness records of bituminous macadam, plant oil mix, road oil mix and armor coat built by construction funds are shown in tabulated form. These records of the lighter types of pavements are not to be assumed as being truly representative of the results being obtained by any of the individual districts as time did not permit the securing of records of all of these types of projects constructed.

Detailed figures on 1929 construction records will be found on pages 20-24.

"SAY IT WITH INK"

James F. Collins, State Director of Professional and Vocational Standards, gives the above advice to contractors.

Practically all complaints filed with Collins against contractors under the contractors' registration law, have resulted from misunderstandings and disagreements under verbal contracts. The director says:

"There is altogether too common practice in the construction industry in California of carrying on the business through verbal contracts. It is obviously impossible to bring the information affecting a controversy between contracting parties to a basis upon which a decision can be rendered when the memories and personal interpretations of the contracting parties is all that is available for evidence.

"This menace to efficient and harmonious settlement of disagreements between contractor and client, or between contractor and subcontractor, will exist until the construction industry brings itself to a business-like method of contracting, whether it be for big or little undertakings."—*California Constructor*.

"I didn't begin with askings.

I took the job and I stuck;

And I took the chance they wouldn't.

And now they're calling it luck."

—Kipling.

Mother—"Why did you strike your little sister?"

Young Bobby—"Well, we were playing Adam and Eve, and instead of tempting me with the apple, she ate it herself."—*Vancouver Province*.

"What do you do?"

"I keep house, scrub, scour, bake, wash dishes, cook, do the laundry, iron, sew."

And the census-taker listed her: "Housewife—no occupation."—*Boston Transcript*.

The Modern El Camino Real

By COLONEL JNO. H. SKEGGS, District Engineer

COULD the old mission padres of early California history see today the modern El Camino Real replacing the original winding, dusty trail which they trod on foot or rode on the back of the slow-moving donkey, it is difficult to state which would seem the more miraculous to them—the myriads of swift self-propelled vehicles slipping by, or the smooth wide roadway stretching ahead mile after mile in long, straight courses, varied with graceful curves. It was lovely in

Of first rank in importance on this highway is that section from San Francisco to San Jose. Locally, this section of the El Camino Real has assumed the name of the Peninsula Highway. For years it was the only through artery serving the Peninsula and San Francisco, and of passing interest Contract No. 1 under the California Highway Commission in 1912 and 1913 was let for constructing that portion of this road from South San Francisco to Burlingame in this section.

The parallel building on the Peninsula of the Skyline Boulevard, Route 55, which was started in 1923, and the Bayshore Highway, Route 68, commenced in 1924, somewhat contrary to expectations has failed to halt the steadily increasing traffic on Route 2, the Peninsula Highway. This is due to the rapidly growing urban settlements along the Peninsula, many towns showing an increase in population of over 100 per cent in the last ten years.

From reconstruction funds allotted in the budgets of the past and present biennium, construction of the 14-mile section from Palo Alto to Santa Clara is now in progress. This extends approximately from the Santa Clara County line at San Francisquito Creek in Palo Alto to Scott Lane in Santa Clara, and passes through in succession the towns of Palo Alto and Mayfield (now combined as Palo Alto), Mountain View and Sunnyvale.

This section calls for three important line changes: one about one mile beyond the heart of Mayfield, some 3000 feet in length; one at



View looking east toward Sunnyvale-Saratoga road intersection where important line change begins.

the simple beauty of those historic days, but they would find it hardly less beautiful now, and far more magnificent.

The transition from the crooked trail of Mission times to the present stately highway has been slow but steady and in keeping with the demands of the day. After the trail came the crooked wagon road, later straightened into the more or less rectangular county road with a definite, though narrow right of way. With the advent of the automobile came the need for a smooth surface, and the metal surfaced county highway anticipated these first demands, after which short stretches of pavement in the vicinity of the larger cities and towns were required.

Throughout the entire progressive movement the "Kings Highway" has retained its identity as being not only the most historic but the most important artery of the state. Latest traffic counts show that this is yet consistently the most heavily traveled state road in California.



View showing the new abutments for widening the San Francisquito Creek 60-foot span arch bridge from present 30-foot to completed 76-foot roadway width.

Anzini's Corner, about 2000 feet in length; and one from Sunnysvale to Butcher's Corner, about 1.8 miles long and saving 0.6 mile distance over the previous location. This 14-mile section is now located with a maximum grade of 1 per cent and a minimum radius curve of 2000 feet.

In brief, the proposed construction calls for utilization of the present 20- to 24-foot width pavement in resurfacing with Type "A" asphalt concrete and widening with asphalt concrete, and concrete over compacted rock base to a 40-foot paved width through Palo Alto; the balance being paved to a 40-foot width of 8-inch to 10-inch thickness of concrete. The roadbed width for the above pavement is approximately 60 feet throughout on a 100-foot right of way. From Mayfield on to Santa Clara the present 20-foot width pavement is to be resurfaced with asphaltic concrete and widened to a completed 30-foot pavement width with 8-inch to 10-inch thickness

tion on a 30-foot width roadbed in the original 66-foot county right of way. All but the last half mile of this was constructed under contract in 1914 of 4-inch Portland cement concrete, with 1½-inch topeka top and 3-foot rock shoulders on either side. The same type of construction was placed on the last half mile by state forces in 1918 and 1920.

The present contract called for placing of 4-inch to 5½-inch thickness of asphalt concrete over the original 20-foot pavement, widening 10 feet on one side only, with 8-inch to 10-inch thickness Class "A" concrete.

A line change of special importance was made from Sunnyvale to Butcher's Corner. This resulted in a saving of 0.6 mile distance and eliminated two right angle turns with 260- and 300-foot radii. This new location, 1.8 miles in length with 100-foot right of way, was paved with 3 ten-foot strips of 8-inch to 10-inch concrete over a 4-inch compacted rock base.



Map showing the modern El Camino Real from Palo Alto to Santa Clara.

concrete. The graded roadbed width is to be 50-feet in general, on a 100-foot right of way.

Due to the interurban nature of this highway, right of way problems present difficulties as serious and almost as costly and difficult as those of construction. About 320 owner-ships are involved in right of way negotiations in this piece of highway.

For convenience in construction, this 14-mile stretch from Palo Alto to Santa Clara has been divided into three sections—4.4 miles of which, from Sunnyvale to Santa Clara, having been completed in December, 1929. Another section 4.7 miles in length from Palo Alto to San Antonio Road is now under construction, and the center link of 4.9 miles will shortly be advertised.

The 4.4-mile portion of the Peninsula Highway between Sunnysvale at Saratoga Road intersection and Scott Lane in the City of Santa Clara was constructed under Contract 04EC5. Bids for this work were received on May 22. Work was commenced June 8 and completed December 26, 1929.

Previous to the above contract, this road had been constructed to a 20-foot paved sec-

Right of way problems on this project were somewhat complicated, the line change alone involving some 22 ownerships and costing, exclusive of moving buildings and improvements, in excess of \$86,000. The total number of ownerships involved was 62.

At Sunnyvale-Saratoga Road intersection, it was necessary to move one commercial garage building 75 feet by 100 feet, two service stations and all fixtures, a cafe, and one residence. Three thousand trees had to be removed. It was necessary to go to condemnation with but one property owner on the entire 4.4 miles of right of way negotiation.

This section is in the heart of a rich territory wholly occupied by orchards and intensively cultivated fields merging into urban settlements. Many interesting features were presented in construction of special siphons for irrigation systems which the new location literally cut in two.

A particularly interesting combined right of way and construction problem presented itself in changing the channel of Calabasas Creek. The original channel of this creek extended easterly and was within the right

(Continued on page 32.)

Progress Report on Bay Bridge Borings

THE State Department of Public Works has made public the following statement regarding the borings in San Francisco Bay in connection with the proposed San Francisco-Oakland Bay crossing. The results of holes drilled to date on three different lines are tabulated herewith.

Sixteenth street line.

This line of holes, being numbers 18, 19, 20 and 21, on the map, starts opposite Sixteenth street in San Francisco and crosses to Alameda at a point approximately 8000 feet south of the Alameda Mole.

Rock was found only at boring No. 21, the hole nearest the San Francisco side, at a depth of 292 feet below mean low water. This line has been abandoned as being impractical on account of the great depth to rock.

Pier No. 34 line.

This line of holes, being numbers 1, 2, 3, 4, 5, 6, 7, 9, 11 and 17, starts at Pier No. 34 in San Francisco and crosses to a point on the Alameda shore about 1200 feet south of the Alameda Mole. In the hole just off the end of Pier No. 34 rock was found at a depth of 223 feet below mean low tide. Holes 5, 6 and 7 at an approximate distance of 2800 feet from the pier line and on Rincon Reef showed rock at 44, 49 and 50 feet, respectively. At a point 1600 feet from the pier line rock was encountered at 110 feet below water. Hole No. 1, 6800 feet from the end of Pier 34, encountered rock at 293 feet below low tide. The remaining holes on this line were stopped at a depth of around 300 feet without encountering rock.

Goat Island line.

This line of holes extends from Pier 22 in San Francisco to Goat Island and thence to the Oakland shore near the Key Route Mole and are holes numbers 8, 12, 22, 23, 24, 25 west of Goat Island and holes 13, 14 and 16 east of Goat Island. At the end of Pier 22 rock was encountered at a depth of 163 feet below tide. At 3500 feet off Pier 22, rock was encountered at 140 feet, and holes 150 feet east and 200 feet west of hole 23 found rock at a depth of 127 and 143 feet, respectively. These holes are numbers 23, 24 and 25. Hole No. 12, located 2000 feet west of Goat Island, encountered rock at a depth of

158 feet. Hole No. 10, 600 feet off Goat Island, encountered rock at a depth of 87 feet. Hole No. 16, located 600 feet east of Goat Island, found rock at a depth of 217 feet. Hole No. 13, located 1500 feet east of Goat Island, struck hard material at 190 feet, but was jetted to 270 feet below high tide. Hole No. 14 penetrated largely sand to a depth of 323 feet.

It is expected that borings will be completed by July 1st, and the final report of preliminary borings made to the Bay Bridge Commission shortly afterwards.

The map herewith shows the location of the holes and the material encountered at the bottom of each boring. The State Department of Public Works, Division of Highways, wishes to emphasize the fact that this is simply a preliminary statement of progress.

The final report when complete will be made to the San Francisco Bay Bridge Commission for such action as it may deem best.

The San Francisco Bay Bridge Commission was appointed jointly by President Hoover and Governor Young, the President naming Mark Requa as chairman and Rear Admirals L. E. Gregory and W. H. Standley, representing the Navy, and Colonel G. D. Pillsbury and Major E. E. Daly, representing the Army. Governor Young named Senator A. H. Breed, Professor O. D. Marks of Stanford University, George Cameron of San Francisco, C. H. Purcell, State Highway Engineer.

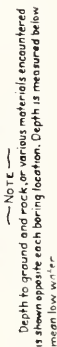
Funds for the borings are being supplied by the city and county of San Francisco and the State Bridge Authority, which was recently organized under the Toll Bridge Laws, passed by the last Legislature.

With the receipt of the report by the San Francisco Bay Bridge Commission, it is expected that an early meeting of the commission will be held and the subject fully discussed. From present indications this meeting of the commission should take place some time in July or August.

The teacher was giving the class a lecture on gravity.

"Now children," she said, "it is the law of gravity that keeps us on this earth."

"But, teacher," inquired one small child, "how did we stick on before the law was passed?"—*Hercules Record.*



Welcoming Nonresident Car Owners to Tour in California

By FRANK G. SNOOK, Chief of the Division of Motor Vehicles

FEW STATES in the Union are as liberal toward the driver of the nonresident or out-of-state car as California.

California permits all nonresident cars from every state to remain here six months without securing a California license if the motorist takes out a nonresident permit within ten days from the time he enters the state.

Many states require the visitor from other states to secure a license almost as soon as he arrives. Other states have a "reciprocity" arrangement which gives the visiting motorist the same length of time to secure a license as is given in the state from which he comes.

If a visitor indicates his intention of staying in California less than ten days he is not even required to secure a visitor's permit. However, if he stays longer than ten days without getting such a permit, he is required to get his California license immediately.

Even this is no hardship, comparatively speaking, as California's license fee of \$3 for passenger cars is the lowest in the country. In some states the fee runs as high as \$50 and \$60 annually.

Our liberality toward the out-of-state motorist is bearing fruit in a constantly-increasing tourist crop. Already the 1930 season gives promise of being a record-breaking one. During the first three months of the year visitors' permits were issued to 15,800 cars, and what is still more gratifying we issued California licenses during this period to 31,141 out-of-state motorists, indicating that large numbers of these visitors like California well enough to make it their home.

Few people realize, possibly, the big part the Division of Motor Vehicles plays in welcoming these visitors and in assisting to make their respective visits pleasurable. They receive almost their first impression of California at our border or "courtesy" stations where our officers register them and issue visitors' permits to them.

We are striving constantly to instruct these nonresidents in our laws for their own protection as well as the protection of the people of our own state. Our hardest task is to acquaint them with the regulations governing registration. These regulations are,

necessarily, somewhat strict for the automobile thief is constantly at work moving cars from one state to another and knows every weakness in the registration laws.

In general, we require the following from the prospective nonresident registrant:

1. Proof that the applicant's car has been registered properly in his own state. The certificates of registration and title are generally regarded by us as sufficient to establish this. In the absence of certificate of ownership or title, a notarized bill of sale is required.
2. Proof that the applicant has permission of the legal owner (if there be one) to register the car in California and that all prior claims of any other character against the car have been satisfied. This means written permission from the lien holder, usually obtainable by a telegram.

We have little trouble with the rank and file of the nonresidents, most of them being able to furnish us readily with proof that is satisfactory. Most of them recognize that while these regulations are somewhat stringent they protect the registrant as well as the public. We find that the registrant who kicks is very likely to be the registrant who is trying to "put something over."

California system of registration is recognized as one of the finest in the United States. The "pink" certificate is regarded everywhere as indisputable evidence of ownership of the car. This is one of the reasons why crooks are constantly figuring out schemes for breaking down our system knowing that if they can obtain our certificates they will have a better chance to dispose of their ill-gotten gains.

Another angle of the nonresident situation that gives us much trouble is that matter of licenses for operators. During the last few years California has been building up a rather stringent system of licensing operators, the aim being to weed out the unfit and to increase the general standard of drivers.

At present all applicants for an original license must submit to an examination of their general fitness to drive and a new section of the law permits the division to give examinations every two years to all operators.

The application of our laws to the nonresident has been a matter requiring con-

(Continued on page 16.)

The Science of Mechanical Ventilation

By CARL A. HENDERLONG, Assistant Engineer, Division of Architecture

MODERN methods of heating and ventilating assembly halls and theaters require considerable study. It is the purpose of this article to describe in a brief non-technical way, the methods used to provide suitable heating and ventilating for theaters and also to describe the system as laid out for the new Assembly Hall at Chico which follows closely modern theater practice. This new Assembly Hall is, in reality, identical in construction to a theater; contains a full size stage and has a seating capacity of 1500 persons.



CARL A. HENDERLONG.

Most of us are occasionally patrons of the theater. Perhaps some, in moving their feet around under the seats, have kicked against the ventilator, or mushroom as it is technically called, and won-

dered just what its function was.

As will be shown later, the problem of satisfactory theater ventilation is mostly an example of cooling, even in the winter time with the air outside being around the 40-degree mark.

A number of people congregate for entertainment in a cold room. The room soon becomes hot, often uncomfortably so. This results from the heat given off by the occupants. An adult at rest, gives off in bodily heat, approximately 450 B.t.u. per hour. A B.t.u. or British thermal unit, is the heat necessary to raise one pound of water one degree Fahrenheit.

In a theater or assembly hall of average construction containing 1500 seats, if filled to capacity or nearly so, the amount of heat given off by the occupants would be more than sufficient to heat the room well above 70 degrees Fahrenheit with outside temperature 40 degrees, provided no outside air were introduced. In fact, an overheated and uncomfortable condition would soon be produced.

It thus becomes apparent that some method of cooling is necessary, virtually at all seasons of the year. Many of us will perhaps recall some of the theaters of a few years ago. Lack of mechanical ventilation of any kind made even the most enjoyable of shows at times rather depressing. Thirty to fifty cubic feet of air per person per minute is now accepted by the Engineering Fraternity, as a satisfactory amount of air for proper ventilation of theaters.

Some of the eastern states require mechanical ventilation for all theaters, halls or in any crowded place of assemblage. There is no such ventilating code in California. Theater owners, however, realizing that the satisfactory patronage of their shows required adequate provision for ventilation, have in the main, installed such systems.

The Assembly Hall now under construction at the Chico State Teachers College, has a seating capacity of 1500. This requires that not less than 45,000 cubic feet of air per minute be supplied into the building for proper ventilation and cooling. This large volume of air must be introduced into the building without drafts of any kind and also in a way so as not to interfere with the architectural scheme of decoration and design. The ventilating fans and other equipment must also operate noiselessly or nearly so, since any apparent noise would be objectionable to the theater performance.

There are two systems in common use for the introduction of the fresh air into the building: one known as the downward or overhead system requiring the air to be introduced at the ceiling through grilles of openings, and the other the upward system, which supplies air through mushrooms located under seats. A mushroom, as it is called, is nothing more than a bell-shaped top placed over a cast iron or steel sleeve 6 inches to 9 inches in diameter, which sleeve is in turn connected to the air duct or plenum space below the floor of the theater. Raising or lowering of the bell regulates the amount of air passing through it. The former system required refrigeration for cooling the air in hot weather while fairly satisfactory results are obtained with only air washers for cooling if the upward system is used.

When expense of installation and operation is not an important factor, refrigeration and the downward system produces by far the most satisfactory results. With properly designed equipment, it is perfectly possible to maintain a temperature of 70 degrees Fahrenheit and 40 degrees humidity in the theater at all times, even though it may be 110 degrees in the shade outside. Since the cost of an adequate refrigerating system for cooling such a volume of air

(Continued on page 34.)

How One Traffic
Officer Helped

Thanks For These
Kind Words

Best Safety Rule
Is "Obey the Law"

Clippings, Letters and Comment



Dealing With State Highways

Running Time is
Cut In Half

Registration and
Fee Figures For
California

Urges Good Roads
Across Continent

Traffic Officer Helps Mother and Babies.

This letter comes from Oroville:

Motor Vehicle Dept.,
Sacramento, Cal.

Dear Sirs:

I wish to compliment you on the speed cops of Butte County. I wish to say we have, to my judgment, real gentlemen here. The other day while motoring from Oroville to Gridley, I picked up a tack in my tire and was stalled with three little babies, from four years to nine months old.

I could have changed the tire alone, but I wish to state that I certainly appreciate the help which I received from our speed cop, and I wish to send my thanks into you for helping to maintain such gentlemen. Perhaps there are quite a few complaints sent in about all of them, and I do not feel that a few compliments and thanks sent in will hurt them, especially the ones of this district.

Yours truly,

Mrs. E. L. Johnson and babies,
Oroville, California.

* * * * *

Thanks For These Kind Words.

This letter comes from F. Z. Lee of Los Angeles:

Today I saw a copy of your magazine CALIFORNIA HIGHWAYS AND PUBLIC WORKS and I was very agreeably surprised at wonderful amount of information contained in it. Too, the very attractiveness of it puts it on a high class as a magazine.

I would certainly like to get the magazine and would appreciate your putting my name on the mailing list for the publication.

If the February number is available I would be very glad to get it. It has a very useful map on the back cover.

* * * * *

Best Safety Rule Is "Obey The Law."

Floyd G. Yoder, member of the Orange County unit of the California Highway Patrol writes as follows in the April issue of *The Police Blotter*, publication of the Orange County Peace Officers' Association:

YOU are responsible! YOU who read, write and sometimes think, YOU who operate an automobile,

YOU who have occasion to ride in one, and YOU who find it necessary at times to cross the street or walk upon the highway. Just YOU few mentioned above. Those who do none of these things can not be held responsible, and need not cringe at the finger of accusation.

Death—the cold, final word, *death*, uttered 2100 times over the bodies of automobile victims in this state of YOURS during the year 1929. Thirty-two thousand and some odd injured. Many of them cripples for the remainder of their days.

How can this all happen in one short year, happen before your very eyes, happen to your friends and loved ones, and what did YOU do about it? WHAT ARE YOU GOING TO DO ABOUT IT IN THE FUTURE?

Two thousand one hundred killed. There they lie side by side in our imaginary lane of graves stretching for one and one-half miles. What's in the picture? Why the cause? Simply this: "man's inhumanity to man," our indifference to the rights and cares of others. Remember this, every time you see or hear of an accident, *one or more persons are responsible*. The automobile itself is not a thing of death. The human element behind that automobile is alone responsible.

There is no other calamity that could strike this or any other state that would exact 10 per cent of the toll of lives taken by our road rudeness without arousing the entire citizenry to aid, assistance and preventive action.

Someone asked, "What can I do about it?" It is a singular fact that a little over 50 per cent of accidents are accompanied by a violation of the California Vehicle Act. You can therefore—OBEY THE LAW. That will cut the accident rate by one-half. Extend to your fellow man on the highway the same courtesy and consideration you extend to him on the sidewalk or in the elevator and you will cut the other half to a surprisingly low figure.

* * * * *

Road Cuts Running Time More Than Half.

The Calexico *Chronicle* in a recent issue has the following to say:

Yesterday I traveled over 30 miles of the state's oiled highway in Chuckawalla Valley between Blythe and Mecca.

The state engineers solved the question by adding a small amount of gravel to the native material—which is mostly sand—and then adding oil. The result is a road which for all practical purposes is equal to a paved highway. The running time for the 94 miles between Mecca and Blythe is now 2½ hours. Before the state took over the road the minimum time for the trip was 6 hours.

Registrations And Fee Figures Given For State.

Although California ranks second in the United States in the number of motor vehicles in use, it is tenth in total amount of registration fees paid, according to the United States Department of Agriculture figures.

New York leads in the number of motor vehicles registered with 2,263,259, and also is first in registration fees with \$38,293,313.

California is second in vehicles registered with 1,974,341, but collects less than one-third of the registration fees of New York, with \$10,489,068. Until recently New York had no gas tax, which may account for its high registration fee. Pennsylvania is second to New York in registrations, with \$29,264,495, but is fourth in the number of automobiles registered.

In addition to more than \$10,000,000 in registration fees, Californians pay over \$30,000,000 in gas taxes in the state. However, the gas tax is general now throughout the United States, varying from 2 to 6 cents a gallon. California pays 3 cents a gallon, which is a little below the average for the nation.

* * * * *

Urges Good Roads Across Continent

The following letter has been received from Sam S. Porter of San Diego, one of the foremost enthusiasts in good road construction in California:

San Diego, California, March 20, 1930.

Governor C. C. Young
Sacramento, California

My Dear Governor:

Have been reading, for some time now, dispatches re the unemployment condition. Am of the belief that the building of more county, state and national highways would tend greatly to solve the question of the unemployed.

In building hard surface roads across our continent, one from the Atlantic to the Pacific for the southern states, one from the Atlantic to the Pacific through the heart of our United States, and one from the Atlantic to the Pacific for our extreme northern states, would not only give employment to the majority out of work but would stimulate business industry through materials to an extent, I believe, far beyond our fondest expectations.

Personally, I believe that the building of good roads will absolutely relieve the labor question. It not only gives the real laboring man employment, but will give many a professional man, work, such as engineers, superintendents, draughtsmen, etc. Such work will consume, with a multitude of men employed, vast amounts of foodstuffs, it will use divers kinds of machinery, plows, scrapers, steam shovels, tractors, camp outfits, etc., as well as oil, asphalt, sand, rock and cement; and to me the strength of it all is that no section of our country would be getting an overproduction of anything, but something that is bound to benefit all.

Business men everywhere should boost the crusade for employment of labor on road building. I believe it will mean the greatest relief for the unemployed a condition which is to be deplored; it will also help to maintain a national wage scale—which would mean a higher standard of living for the wage earner.

Good roads everywhere mean increased travel and a

community that is not easy of access and that can not be reached by innumerable feeders, in the shape of good roads branching in every direction, will find itself isolated.

With our nation, our states, our counties, our cities, all in the mood and our citizens clamoring for more and better roads, we should not relax. "More and better roads" should be our slogan. Good roads make good business. If we could just keep up a united stand while the people are in the humor, and all put our best efforts into getting road building started right away and with no further delays, what a blessing it would be throughout the United States.

Of course, I realize perhaps the public should be advised some in advance on this subject and too much can not be said in favor of good roads. The press is a moulder of public opinion and can help much; but those who have the power to place and push in the world we should try to reach.

A few good points for good roads: Good roads stimulate production. Good roads would mean better service at less cost. The save of wear and tear on conveyances, the speedier transaction of business and many other advantages.

By the building of good roads we are not producing anything that will be a drag on the market. Analyze the great good that will come to any royal citizen by virtue of good roads. They will help keep the motor owner out of the mud and dust if he can drive over a good, modern paved highway. Our country is alive with auto owners. It is possible now for people of moderate means as well as wealthy people to enjoy the use of an automobile, and they are constantly moving about. And it has been the experience of towns and counties that have developed their highways, that business has been stimulated and all have profited thereby. So what it will do for a community it will do for a county, a state, or our great nation.

As we build paved roads transforming our dirt roads into smooth dustless 365 day a year boulevards we must of necessity stretch our purse strings and help pay, but it will be worth it, and we should encourage good roads. Already our national highways are doing wonders and they should be supported by everyone. There should be an even greater movement in the United States in favor of all good road projects.

Good roads must be back of the business battle line.

In this connection an unknown author has aptly said: "Roads rule the world—not kings nor congresses, nor courts, nor ships nor soldiers. The road is the only royal line in democracy, the only legislature that never changes, the only court that never sleeps, the only army that never quits, the first aid to the redemption of any nation, the exodus from stagnation in any society, the call from savagery in any tribe, the high priest of prosperity, after the order of Melchisedec, without beginning of days and end of life. The road is unpire in every war, and when the new map is made, it simply pushes on its great campaign of help, hope, brotherhood, efficiency and peace."

I believe Chambers of Commerce in every progressive city in the United States should support a movement for good roads across our continent. I realize good roads mean work—constant work—and real cooperation, and that the citizens would be behind our government for a movement of this kind that would benefit so many of our good people.

With good wishes, believe me,

Cordially and sincerely,

SAM S. PORTER,
The San Diego Hotel.

Progress Made on Feather River Lateral

By H. S. COMLY, District Engineer

WHEN the final decision was made on the route of the Feather River Highway early in 1928, the so-called North Fork Route being selected, steps were taken at once to get the work under way. In March, 1928, two field location parties were organized, and the location surveys commenced at the two ends of the route. These surveys were followed by the construction of two convict camps in the months of May and June, and active work commenced on construction at both points about the first of July, 1928. One of these camps was established about 8 miles northeast of Oroville, at the center of a 7-mile section from the crossing of the Feather River upstream, while the other one was installed about a mile down the river from the station of Paxton, in Plumas County, at the center of an 8-mile section, extending from Spanish Peak to a connection with the county road between Quincy and Westwood.

The general scheme of work proposed was to construct the 69-mile section between Oroville and the above county road connection, leaving the 9-mile section from that point to Quincy for the last construction, as traffic is served by a fair road on that section at the present time. Meanwhile, during the construction of the above mentioned 69-mile section, the state has and will maintain the existing county road direct from Oroville to Quincy, which traverses the ridge between the North Fork and the Middle Fork of the Feather River. This road is closed by snow for five or six months of the year as a usual thing, but with the improvements made on it since the state has maintained it, handles traffic very well during the remainder of the year.

The entire length of the proposed construction between Oroville and Quincy is 78 miles, and the total cost of the work was estimated at approximately \$7,000,000 in 1925, this estimate being based on a highway with a graded roadway 20 feet wide and a crushed rock surface 18 feet wide. The estimate was based on what information was available from old surveys which were made on a low standard of alignment, grade and width, several years before, and for this reason it was necessarily approximate. During the succeeding years our standards of alignment and grade

have become much higher. However, based on estimates made on our present location surveys, on which the higher standards are used, and construction costs to date, it does not appear at this time that the above mentioned figure will be materially exceeded unless a wider standard of road is adopted on the remaining work.

Included in the 78 miles of construction are 14 bridges from 40 to 700 feet in length, and four railroad grade separations, the cost of these structures being included in the above mentioned estimated total cost.

During the past 21 months, since the inception of the work, 17 miles of highway have been graded and 4.5 miles surfaced, at a total expense of \$995,000. Also, the bridge across Indian Creek, in Plumas County, has been constructed at a cost of \$30,000, and the large bridge across the Feather River, 4 miles northeast of Oroville, is now under construction, and when completed, about September 1st, will have cost \$170,000. The total expenditure at this time, therefore, including the amount which will be expended in completing the last named bridge, is \$1,195,000. The above mentioned work is distributed as follows:

Construction by convict camp number 16, at Paxton, of 6.5 miles of graded highway at a cost of \$430,000. The Indian Creek bridge was also built by this camp at an expense of \$30,000, making the total expenditure on this section \$460,000.

Construction of 6 miles of graded highway by convict camp 17, located 8 miles northeast of Oroville, at an expense of \$365,000.

Construction of a graded highway with crushed rock surfacing from Oroville to the Feather River crossing, 4.5 miles, at a cost of \$170,000.

Feather River bridge, 4.5 miles northeast of Oroville, 700 feet in length, at an expense of \$170,000.

In addition to the above mentioned accomplishment, plans are now completed on a 2-mile section of highway just south of Pulga, about 35 miles northeast of Oroville, and this work is just being advertised for contract. In connection with this section, plans are now being prepared by the Bridge Department for a bridge across the Feather River at the northerly end of the section, and it is expected that this work will be placed under contract in the near future. This grading project is estimated to cost \$325,000, and the bridge \$150,000. Including these two projects,

which are budgeted in this biennium's program, and the total expenditure to date given above, the funds which have been expended or are directly obligated, for the construction of this highway amount to \$1,670,000.

When these projects are completed, 19 miles, or approximately 25 per cent of the road will have been graded and 4.5 miles of this length will have been surfaced, and there will, therefore, remain approximately 59 miles to be graded and 74 miles to be surfaced. The surfacing of the 14.5 miles of highway which will have been graded but not surfaced, will cost about \$100,000, so that the entire cost of these 19 miles will be \$1,770,000, or approximately 25 per cent of the total estimated cost. These 19 miles include some of the heaviest construction on the route and two of the most expensive bridges, but they also include some of the lightest construction on the road, so they represent a fair average of the entire construction, but if anything, the remainder of the work will be somewhat heavier in cost.

It is proposed to continue the work with the two convict camps and it is expected that these two camps will complete the sections they are now on and move to new locations, as indicated on the map, in the late summer of this year. Camp 16 will engage in the construction of a 10-mile section from the mouth of the East Branch to Spanish Peak, at the westerly end of their present work. Camp 17 will engage in the construction of the 7-mile section from the end of their present work to a point in Dark Canyon, about 2 miles south of the Big Bend road. In general, it is proposed to contract all of the work between the work covered by these two camps, that, from Dark Canyon to East Branch, a distance of approximately 31 miles, of which 29 miles has not as yet been directly obligated for construction. The 9-mile section from the connection to the county road east of Paxton to Quincy will also be constructed under contract, according to present plans. The future prosecution of the construction of the 38 miles which it is proposed to contract and of the remainder of the convict work on this road will depend upon the rate at which funds become available for the work.

In preparation for the future prosecution of the work, three large location parties are now at work in the canyon, completing the surveys. It is expected that all location surveys will be completed late this summer or early in the fall. To date, 48 miles of location surveys have been completed, and 30 miles remain to be made.

U. S. Reclamation Board Aids in Water Study

CLEARING the way for early completion of investigations into California's coordinated water program, with a view to securing definite action on the project at the next session of the State Legislature, Governor Young announced today that the United States Reclamation Bureau will undertake an immediate economic study of the water conservation plan.

The Reclamation Bureau inquiry, designed chiefly to determine the physical and financial feasibility of the proposed plan for conservation and full utilization of Sacramento-San Joaquin Valley waters, will be carried on under a cooperative agreement initiated by Governor Young with the United States Department of the Interior. It will supplement the work of army engineers, now investigating navigation and flood-control phases of the problem, and the study of the Hoover-Young Water Commission.

Governor Young announced that the Secretary of the Interior has approved a \$25,000 deficiency appropriation as the federal government's share in cost of the investigation, which will be matched by a similar state allotment.

"I am very gratified at this new evidence of the earnest desire of the national administration to assist California in working out a satisfactory solution of our water problem," Governor Young declared, in announcing enlistment of the Reclamation Bureau's aid.

"We now have the effective cooperation of the branches of the federal government most directly concerned, namely, War Department, Federal Power Commission and Bureau of Reclamation. It is hoped and anticipated that under the program laid out and with the assistance of these federal offices and the various commissions functioning, a full report can be presented to the California Legislature, which will convene in January of next year. It was most important, in connection with the full investigation, that certain studies relative to irrigation and reclamation phases be made by or in cooperation with the Reclamation Bureau. This is now assured."

The Reclamation Bureau survey, it was announced, will bear on the following points:

The character and urgency of the requirements for water to be used for irrigation purposes.

The available water supply.

(Continued on page 26.)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MEER Director
GEORGE C. MANSFIELD Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 8 MAY, 1930 No. 5

State Building at Santa Barbara is Highly Commended

The Division of Architecture of the Department of Public Works has been honored by the following award made by the Community Arts Association:

The Community Arts Association

Plans and Planning Branch

Presents

Honorable Mention

Among the Best Examples of

Civic and Commercial Architecture

Erected in Santa Barbara, California

in 1929

to

Auditorium
State College *State of California*
Building *Owner*

State Architects

Architect

Judges

W. T. Chambers
Chas. H. Conway
W. P. H. Smith
J. W. Kemmer
February, 1930

The automobile license plates in Pennsylvania, which bear no more than five characters, display many amusing combinations. Among the odd ones are "123-Go," "MA," and "PA," "US," "OH," "4U2" and "F2," which is attached to the hearse of an undertaker in Chambersburg.

WELCOMING NONRESIDENT CAR OWNERS TO TOUR IN CALIFORNIA

(Continued from page 10.)

siderable tact and judgment on the part of our officials. In general, it has been our practice to permit the nonresident having a driver's license from another state to proceed unmolested.

If he has no such license or comes from a state where no license is required he must take the examination. We feel this is just for in the interests of safety we are entitled to know whether he can drive well enough to measure up to our standards.

There are a number of states, notably those in the south, where there are no requirements of any kind for driving a motor vehicle. Our officers are furnished with lists showing the requirements in every state.

These lists show also the date of expiration of registrations in all states and other information necessary to the officer in dealing with the nonresident.

The value of the tourist crop in dollars and cents can not be estimated. It unquestionably runs into the millions of dollars every year. It is the constant endeavor of the Division of Motor Vehicles and its subsidiary bodies to do everything possible to make these visitors feel at home.

THE ROAD

By HILAIRE BELLOC

The road is one of the great fundamental institutions of mankind. We forget this because we take it for granted. It seems to be so necessary and natural a part of human life that we forget that it ever had an origin or development, or that it is as much the creation of man as the city and the laws.

Not only is the road one of the greatest human institutions because it is fundamental to social existence, but also because its varied effect appears in every department of the state.

It is the road which determines the sites of many cities and the growth and nourishment of all.

It is the road which controls the development of strategies and fixes the site of battles.

It is the road which is the channel of all trade and, what is more important, of ideas.

In its most humble function it is a necessary guide without which progress from place to place would be a ceaseless experiment; it is a sustenance without which organized society would be impossible; thus, and with those other characters I have mentioned, the road moves and controls all history.

"You know, automobiles are making people lazy."

"They are, are they? Say, did you ever see the pedestrians trying to get across the street at a busy corner?"

THE MAXIMUM CONSERVATION OF WATER WITH REFERENCE TO THE CALIFORNIA PLAN

(Continued from page 2.)

region were so arid that the available water had been or could be completely utilized under private auspices no other agency would be needed.

Assuming this condition of relative surpluses and deficiencies, a searching engineering analysis should be made to devise the best technical and economic method of solution. The area of surplus becomes the subject of an intensive study to determine the true amount of exportable water, and in this connection the state investigation must assume ultimate development within said region as it would be poor policy to export water from one area to another for the same use to the material detriment of the first. The present and ultimate supplemental needs of the deficient areas are also ascertained, and then it becomes an economic question as to whether or not exportation can be planned and carried out at a cost which will be justified by the benefits received. It will be found at once that certain supplies of water can not be regulated or captured without excessive costs, which may be on account of wide irregularity of occurrence, lack of suitable reservoir sites or of geographic or topographic location which would require transmission conduits of great length.

In developing a plan for maximum ultimate use, however, the engineer is not entirely limited to present day values, since the accomplishment of the total plan will probably take generations and values can reasonably be anticipated to increase in this time. In California water sells as low as 37½ cents an acre-foot in some agricultural localities and in others, under somewhat similar conditions, as high as \$30 an acre-foot. Certainly the lower figure will increase rapidly with future development.

In such a plan reservoirs can be made to serve a wide utility of purposes. Conservation reservoirs of large capacity located in the foothill regions of a stream channel are approximately at the dividing line between the valley and the mountain watershed. Such reservoirs will permit hydroelectric power, mining, and such incidental agricultural and other uses as occur in the mountain regions to proceed unrestricted with but negligible inter-

ference, as the released and returned waters will be reregulated by the storages below the upper users and made available for municipal, irrigation, industrial and other services in the usual manner below the foothill reservoirs.

The reregulated waters are passed through a power house at the foot of each dam under a schedule of diversion which will produce the maximum power revenue obtainable, subordinate, however, to the requirements for irrigation and other uses. During the early years of the irrigation development the demand for these purposes will be small and the diversion schedules can fit closely with the power demand curve and under this condition many of the large foothill storages proposed in California will produce sufficient by-product power revenue to carry the greater part of the fixed charges of the respective projects. As the irrigation demand increases the character of the power will change from firm to secondary and this revenue will materially decrease.

This is all predicated upon the theory that power generation at the foothill reservoirs is secondary to their other uses, which is commonly accepted as a state policy, as power is obtainable from other sources, while water is not. The development of hydroelectric power in the mountain watershed above will usually increase the utility of the foothill storage as the latter is the residuary legatee of all waters stored upstream for nonconsumptive use in the watershed.

A reservoir of sufficient capacity may also be used to a material degree for flood control. Flood control and other uses may seem to be difficult of reconciliation in a single storage due to the fact that to serve flood control alone the reservoir space is reserved for that purpose, while to accomplish the other intents it is ordinarily filled as quickly as possible, and many engineers believe that these uses can not be combined except through the medium of open ports in the dam which dedicates the storage space above the ports to flood control and the space below to other purposes. An intensive study of flood flow characteristics has, however, led to the conclusion that the use of reservoirs for flood control is compatible to a marked extent with that for other services.

Knowing the seasonal characteristics of rainfall and runoff on a given drainage basin and stream, it is possible to design a method of holding a predetermined amount of storage space in reserve through the flood season for equating of the peaks, and after the flood

danger has definitely passed to allow the reserved space to fill and permit the reservoir to perform full service thereafter for other uses. While the power head is decreased during the flood season, by passing the larger amounts of water available at that time of year through a lower head, the loss in power output can be kept to a minimum.

Thus in California, at least, a single reservoir of large capacity may serve all or any of the following uses; domestic, municipal, irrigation, industrial, navigation, flood control, mining, salinity control and hydro power. Navigation would be benefited by released water from the reservoir increasing the depth in the channels during the period of low flow, and salinity encroachment would be held back by the outflow of fresh water. The design of the transmission and distributary works to effect delivery of water from the areas of surplus to the areas of deficiency is carried out along standard engineering lines.

Coordination of the water supplies and uses to form a plan for maximum conservation on the above basis then requires, as is apparent to any hydraulic engineer, intensive scientific and engineering analyses on the basis of the most complete obtainable basic data. With such an ultimate plan laid out the next step is to specify the proper economic order in which the various units should be constructed, as it is axiomatic that units should not be built but reasonably in advance of their need. Interest charges on unused works, resulting from too optimistic estimates of the progress of colonization, are one of the chief sources of embarrassment to irrigation projects in the west today.

Assuming the best possible progressive engineering plan devised the whole field of economics is opened up as to what are the benefits to be anticipated from its execution, the proper rate of development of units of the project, the financing and the equitable allocation of costs among all beneficiaries, including the state and the federal governments. The state and the United States should be expected to participate in the costs on the bases of state-wide and nation-wide benefits to be derived under existing state and national policies or as the same may be reasonably expected to be modified in the future. There will be an undoubted state-wide value in that the cities and industrial areas in non-agricultural regions will benefit from increased markets, commerce and transportation, and the national government will be directly aided by whatever is done in the

interest of navigation and flood control and also by the reclamation of land.

The legal phase of the problem must not be slighted as it may contain insurmountable obstacles. Water being an elusive subject, erratic in flow and difficult of measurement, often flowing underground, water law has become equally obscure and difficult and is one of the most fruitful fields of litigation. A thorough legal analysis of the proposed plan, leading up to the conclusion that it is legally and judicially capable of execution, and a reliable estimate of what water rights, rights of way and attendant litigation will cost, both in time and money, is a necessary item in the final cost estimate.

Having carried through such an investigation and produced an answer to each of these items in its proper sequence, a complete physical plan will be available, also a decision as to the immediate units justified if any; a conservative estimate of the cost of the projects recommended, also the anticipated financial benefits to all interests. If the benefits do not justify the cost, construction should be deferred until values and necessities have increased to the required point. If the cost is found reasonable, immediate execution should proceed more or less independently of the amount of the estimate, since no justifiable cost is too large to provide for future growth and development of a state and to prevent retrogression in areas already overdeveloped as regards water supply.

An investigation roughly along the lines heretofore indicated has been under way in California since 1921. The whole history and progress of this state, as with the others in the west, has been and is bound up with the use of its water supplies. From about 1900 on, as the unregulated summer flow of the streams became exhausted, it had become more and more realized that water was not unlimited and that unless properly conserved the growth of the state would be limited thereby. Many areas, large and small, were expanding irrigated areas beyond the dependable water supply, some by over-optimistic estimates based on the records or estimates of flow of a few wet years, but more by pumping from underground sources a greater amount than the replenishment thereto. In one section of the San Joaquin Valley some 20,000 irrigation pumping plants have in the last four years drawn from the underground storage an estimated net amount of 2,000,000 acre-feet in excess of the recharge in the same period. Irrigation diversions on the

rivers tributary to San Francisco Bay have so reduced the fresh water inflow that a delta area of some 400,000 highly productive acres has been seriously threatened by the incursion of salt water from the bay itself. It is beyond the power either of the people in the San Joaquin Valley and southern California, whose underground supply is insufficient, or of the delta area to remedy conditions facing them. These and similar conditions of shortage appeared in a great many places in California between 1900 and 1920, and were accentuated by the series of dry years commencing in 1917. These conditions especially led to the desire for a state-wide investigation and plan for complete utilization of water resources and the rehabilitation of areas facing abandonment of irrigation.

This investigation will have cost by the end of the current year approximately a million dollars, exclusive of stream gaging, topographic mapping and soil surveys. Water and land resources were first classified. From the stream flow data collected under the direction of the United States Geological Survey and the United States Weather Bureau rainfall records, an estimate of the 50-year mean run-off for each stream in the state was prepared. To carry this out for the entire area necessitated evolving new methods of technical attack to enable mass production.

As to precipitation data there were available 277 rainfall station records over ten years in length, many of which were of much greater time. The average or mean annual rainfall was obtained for each station. The total rainfall for a season at any station in per cent of its annual mean, was termed "The Index of Seasonal Wetness" for that year. The indices of wetness for each station for the period were plotted as mass diagrams, showing the accumulated departure from the mean, then by superimposition these diagrams were compared to define the various areas in the state having the same general precipitation characteristics. This established 26 precipitation divisions.

The state was then divided for purposes of study into 140 drainage basins, each basin being either a major drainage or a group of minor drainages. Streamflow records were available at 200 regular U. S. G. S. stations for varying periods up to a maximum of 28 years, and in addition fragmentary records at about 300 additional stations. From these data rainfall run-off curves were plotted and by superimposition critically compared both geographically and by types. Through these

comparisons the characteristic shapes of the curves both geographically and by type were closely determined and it was possible to extend the run-off curves to streams on which there were no actual flow measurements. By these methods rainfall run-off curves were completed for each of the 140 drainage basins in the state. Applying the indices of seasonal wetness in the 26 precipitation divisions to the rainfall run-off curves in the 140 drainage basins the value of the seasonal run-off for every drainage area in the state for the full 50-year period was estimated.

Mass diagrams of run-off were drawn for each area. These were plotted as accumulated run-off in per cent of variation from the annual mean, thereby producing a graph which gives all of the desired information in but a fraction of the space required by the usual mass curves. Irrigation draft lines were then prepared, being plotted in identical units and on the same scales as the mass diagrams. Superimposing the draft lines on the mass diagrams, the utilizable flow of the drainage basin with any given storage capacity was obtained, corrected for evaporation.

The location and amount of the irrigated and irrigable lands of the state were determined and a duty of water fixed for each of 16 agricultural divisions.

Special research was carried out with regard to possible flood control by reservoirs in combination with other uses. The probability of flood discharge for each stream was first calculated, followed by a compilation day by day for the years of record on certain selected streams to determine methods of flood control and their degree of interference with the purposes to be served. It was found that flood occurrence on these streams had controlling and limiting factors, which were as far as possible reduced to graphical representation. A method of flood control operation was devised, depending upon the rainfall to date and other factors. This analysis took much time and effort to complete and is of an intricate technical nature, and was recently issued in printed form.

Underground water studies in various sections of the state were also carried out in greater detail than ever theretofore attempted, and a technical method of evaluating the movement of water underground evolved.

Upon the basis of these engineering studies a preliminary plan for the conservation of the water resources of California was designed. The early units of the plan contemplated re-

(Continued on page 25.)

Detailed Figures on 1

(For an

PORTLAND CEMENT

District	County	Route	Section	Location	Miles	Contract	Contractor
II	Siskiyou	3	B	Shasta River-Gazelle	7 68	22TC1	T. M. Morgan
II	Siskiyou	3	A	Near Weed and Mt. Shasta	0 57	22EC1	Mathews Construction Co.
III	Pleier	3	A	Andora Subway-Lincoln	1 56	03EC3	Fredrickson & Watson
III	Sacramento	3	B	Ben Ali-Sylvan School	8 05	23TC1	Fredrickson & Watson
IV	Sonoma	1	C	Santa Rosa-Willowbrook	11 40	04EC1	E. Paul Ford
IV	Contra Costa	14	A	Through Pinole and Hercules	0 45	04TC2	Prentiss Paving Co.
IV	Santa Clara	2	A	Sunnyvale-Santa Clara	4 60	04EC5	N. M. Ball
V	San Luis Obispo	2	E	Arroyo Grande-Pismo	3 28	05EC1	Cornwall Construction Co.
V	Santa Barbara-Ventura	2	H, G	2 miles S. of Carpinteria-Bonham	1 20	05EC2	McCray Co.
V	Santa Barbara	2	J	Ortega Hill-Montecito	0 31	05FC5	Cornwall Construction Co.
V	San Luis Obispo	2	D	Cuesta-1½ miles S. of Santa Margarita	1 85	05FC6	M. J. Bevanda
VI	Fresno-Madera	4	C & A	Herndon-Tharsa	1 90	06EC4	Hanrahan Co.
VI	Madera	4	B & C	Berenda Xing-Califa	4 59	26EC1	Valley Paving & Const. Co.
VII	Ventura	60	A	Hueneme Road-Little Sycamore Creek	11 60	07VC1	Jahn & Bressi Const. Co.
VII	Los Angeles	60	A	Little Sycamore Canyon-Solstice Canyon	11 46	07VC4	Sander Pearson
VII	Orange	2	B	At Irvine	0 72	07FC7	Steele Finley
VII	Orange	2	D	Santa Ana-Anaheim	4 90	07FC8	Griffith Co.
VII	Orange	2	A	West of San Clemente	0 19	07FC3	Matich Bros.
VII	San Diego	12	D, E, F	Pine Valley-Kitchon Creek	7 78	07CS1	Basich Bros. Const. Co.
VII	Orange	2	A	Serra-San Juan Capistrano	0 71	27FC1	Matich Bros.
VIII	San Bernardino	19	A & B	Ontario-Pomona	2 50	08FC5	Matich Bros.
VIII	Imperial	26	F & G	El Centro-Brawley	9 76	08CS1	R. E. Hazard Contr. Co.
VIII	San Bernardino	26	A	San Bernardino-Santa Ana River	1 77	28VC2	Geo. Herz & Co.
X	San Joaquin	5	B	Panta-San Joaquin River	3 24	210TC1	C. W. Wood

PORTLAND CEMENT

VI	Tulare	4	D	Plaza Garage-Oak Grove School	2 06	06FC2	C. W. Wood
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ASPHALTIC CON

District	County	Route	Section	Location	Miles	Contract	Contractor
*IV	Marin	1	B	Aito-Sausalito	3 31	04EEC1	Hollywood Paving Co.
IV	Santa Clara	2	A	Sunnyvale-Santa Clara	2 75	04EC5	N. M. Ball
IV	Maria	1	B	In San Anselmo	0 56	24EC1	A. G. Raseh
V	Santa Barbara	2	I & G	Stony Creek-Tecolote Creek	3 42	05FC3	Sam Hunter
V	Monterey	2	B	Chualar-Salinas	10 30	25EC1	Peninsula Paving Co.
VI	Madera	4	B	Madera-Berenda Xing	7 42	06EC2	Hanrahan Co.
VI	Kern	33	D	Wasco-Famosa	8 90	06XC1	Valley Paving & Const. Co.
VI	Merced	4	C	Merced-Northerly	0 06	26EE2	Valley Paving & Const. Co.
VII	Los Angeles	9	I	San Dimas Ave-Ramona Ave.	1 40	07FC3	Griffith Co.
VII	Los Angeles	9	I, J, C	Glendora-Claremont	5 50	07FC5	Griffith Co.
VIII	Imperial	26	B, C, D	0 7 mile S. of Kane Springs-Arroyo Salada	13 50	08FC2	R. E. Hazard Contr. Co.
VIII	San Bernardino-Los Angeles	9	A, D	Claremont-Cherry Ave.	10 39	08FC4	Steele Finley

Construction Records

e page 6)

CONCRETE PAVEMENT

Resident Engineer	Street Assistant	Average strength of concrete, pounds per square inch	Average strength, special casts, pounds per square inch	Relation of average strength to special casts in per cent.	Average yardage laid per day	Average daily variation in cement in per cent.	Roughometer index of roughness in inches per mile	Type of equipment used		District
								Mixer	Finisher	
F. R. Baker	A. Bigelow	3,445	4,468	77	271 4	0 34	10 6	Koebring 27 E	2-Ords	II
G. H. Webb	G. C. Harden	3,553			90 7	1 28	17 4	Rex 12 E		II
J. D. Greene	C. E. Woodin	4,914	5,070	98	252 4	0 95	6 8	Foot 27 E	2-Ords	III
C. A. Potter	E. J. Peterson	4,371	4,189	104	361 6	0 69	7 8	Foot 27 E	2-Ords	III
W. A. Rice	E. Caristad	4,279	4,743	90	296 7	4 65	7 3	Koebring 27 E	2-Ords	IV
F. E. Sorenson	L. G. Marshall	4,567	4,726	92	208 8	1 01	10 6	Foot 27 E	2-Ords	IV
C. F. Price	A. D. White	4,118	4,209	98	277 9	1 61	9 5	Koebring 27 E	2-Ords	IV
T. W. Voss	J. S. Peterson	4,556	4,706	93	226 6	0 93	9 0	Koebring 27 E	1-Ord.	V
E. W. Taylor	N. S. Hamilton	3,861			193 6	1 43	8 4	Koebring 27 E	1-Ord.	V
C. T. Schultz	W. G. Remington	3,183			171 5	2 27	6 0	Koebring 27 E	1-Ord.	V
T. W. Voss	J. S. Peterson	3,273			195 9	0 98	8 3	Foot 27 E	1-Ord.	V
R. S. Badger	J. M. Farrell	3,570	3,982	90	296 1	1 16	8 8	Foot 27 E	1-Ord.	VI
W. T. Rhodes	P. A. Boulton	3,505	4,057	86	254 7	1 37	7 0	Koebring 27 E	1-Ord.	VI
C. N. Ainley	W. T. Lamb	3,881	4,763	81	293 6	0 84	7 1	Koebring 27 E	1-Lakewood	VII
A. N. George	C. J. McCullough	3,995	5,128	78	273 8	0 72	7 4	Ransome 27 E	1-Lakewood	VII
W. J. Calvin	J. A. Korner	4,278	4,328	99	148 2	1 02	10 7	Rex 21 E	1-Lakewood	VII
C. N. Ainley	W. T. Lamb	3,976	4,307	92	308 0	0 57	4 4	Koebring 27 E	1-Ord.	VII
H. B. Lindley	T. A. Roseberry	5,238			160 5	0 18	10 2	Rex 27 E	1-Lakewood	VII
J. M. Lackey	C. J. McCullough	3,670	3,793	97	248 9	1 16	6 9	Rex 27 E	1-Lakewood	VII
H. B. Lindley	T. A. Roseberry	5,044			236 3	0 77	11 2	Rex 27 E	1-Lakewood	VII
J. M. Hollister	J. F. Knapp	3,939	4,562	86	141 2	0 81	4 9	Rex 27 E	1-Lakewood	VIII
R. C. Payne	R. B. Millard	3,456	3,280	105	293 1	0 86	11 8	Koebring 27 E	1-Lakewood	VIII
R. C. Payne	P. W. Ball	3,892			211 8	1 00	8 8	Foot 27 E	1-Ord.	VIII
G. R. Hubbard	F. M. Parrish	4,149	3,832	108	231 5	0 72	9 0	Foot 27 E	2-Ords	X

CONCRETE SHOULDERS

F. N. Hveem	F. O. Brown	3,642			112 5	0 62		Foot 27 E	1-Ord.	VI
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CRETE PAVEMENT

Resident Engineer	Street Assistant	Type of finish by miles		Average formage laid per day	Average relative specific gravity of surface mix in per cent.	Average stability of surface mix in pounds	Roughometer index of roughness in inches per mile		Type of equipment used		District
		Hand	Machine				Hand finish	Machine finish	Mixing plant	Finisher	
M. C. Fosgate	R. A. Westbrook & P. O. Harding	3 31		254 8	98 0	9,500	20 4		Madsen		IV
C. F. Price	R. A. Westbrook		2 75	334 4	94 9			13 0	Madsen	1-Ord.	IV
M. C. Fosgate	D. N. Sapp	0 56		137 3	97 2		23 6		Geiger		IV
C. T. Schultz	J. C. Adams & R. W. Beckes		3 42	310 9	98 2	2,803		12 6	Geiger	1-Ord.	V
P. L. Wilcox	E. D. Davis		10 30	790 7	96 4	3,668		7 9	Geiger	2-Ords.	V
H. B. LaForge	P. A. Boulton		7 42	455 6	97 4	4,925		8 2	Geiger	1-Lakewood	VI
	J. A. Whyte		8 90	539 0	95 2	2,150		8 4	Union Tank & Pipe Co.	1-Ord.	VI
R. S. Badger		0 05					23 4		Geiger		VI
W. D. Eaton	H. D. Johnson		1 40	230 3	94 9	3,913		17 8	Madsen	1-Ord.	VII
W. D. Eaton	H. D. Johnson		5 50	582 5	95 3			12 8	Totman	1-Ord.	VII
A. Wallace & J. M. Hollister	E. A. Bannister & C. Foreman		13 50	441 2	96 4	2,921		20 2	Madsen	1-Ord.	VIII
H. O. Ragan	T. B. Landers		10 39	533 8	98 0			19 8	Madsen	1-Ord.	VIII

YEARLY COMPARISONS BY DISTRICTS

District	Miles constructed					Average compressive strength, pounds per square inch, 28 day age								Average roughness, inches per mile					District	
	1924	1925	1926	1927	1928	1929	1924	1925	1926	1927	1928	1929	1924	1925	1926	1927	1928	1929		
I	9.9	6.6					3,340	4,080					4,453	12.2	11.7				11.3	I
II	1.5					8.6	9.6	4,055					3,100		43.0		5.6		5.6	II
III	4.3	7.7	7.2	19.5	4.6	16.5	3,220	3,425	3,810	3,896	3,100	4,439	43.0	29.7		5.6		8.4	8.6	III
IV				5.9	10.0	6.6		5,110	4,915	4,790	3,810	3,896	29.5	15.4	5.7	5.1		10.6	8.6	IV
V																				V
VI		5.0				6.5		4,070				3,523			11.7				7.5	VI
VII	33.9	8.6	44.6	37.2	2.0	37.4	3,295	3,680	4,145	4,410	4,735	3,926	20.8	10.0	6.8	8.1		9.6	7.0	VII
VIII		12.5	3.0		4.8	14.0		3,945	3,800		3,955	3,601		10.0	15.4			11.0	10.2	VIII
IX																				IX
X	13.0	9.0	9.5		11.1	3.2	2,680	4,400	3,960		4,485	4,419	15.9	10.5	6.5			7.5	9.0	X
State	61.1	51.5	55.3	54.0	33.6	102.4	3,150	4,311	4,214	4,510	4,235	3,930	19.2	14.3	7.1	7.8		9.3	8.2	State

PORTLAND CEMENT CONCRETE PAVEMENT

ASPHALTIC CONCRETE PAVEMENT

District	Miles constructed						Average roughness, inches per mile												District
	1924	1925	1926	1927		1928		1929		1924	1925	1926	1927		1928		1929		
				Hand	Machine	Hand	Machine	Hand	Machine				Hand	Machine	Hand	Machine	Hand	Machine	
I		1.8																	I
II		1.1		3.1	0.7	1.2													II
III		0.7		2.5	2.7	3.4													III
IV	7.4	1.9								23.2		21.4				34.2	20.3		IV
V		4.5										27.2				18.7		26.9	V
VI		8.4		10.1	12.2	0.1	16.3					18.9				21.6	10.7		VI
VII										17.3						19.9	8.7	23.4	VII
VIII	2.8															17.6	34.1		VIII
IX			21.3	9.0	2.3	3.5						22.3				30.8	25.7		IX
X	46.4	2.6	12.8							32.3		25.4				29.5			X
State	26.6	16.3	47.7	25.7	7.6	37.2	4.0	63.6	30.1	33.2	24.1	25.2	14.6	30.9	14.7	30.9	13.6		State

BITUMINOUS MACADAM

District	County	Route	Section	Limits	Length in miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile.....	District
I	Humboldt	1	I	Mill Creek-Little River	5.92	21TC3	Healey-Moore Co.	E. A. Wolfe	R. C. Hugberg	47.2	I
III	Yuba	3	A	Dry Creek-Morrison's Xing	1.44	23HC1	J. E. Johnston	J. D. Greene	R. R. Czekowicz	62.5	III
III	Placer	3	A	Roseville-1/2 mile N. of Andora Subway	1.40	23HC1	J. E. Johnston	J. D. Greene	R. R. Czekowicz	58.5	III
III	Placer	37	A & B	Bowman & Weinart	1.65	63TC3	Frederickson & Watson	A. R. McEwen	W. L. McFadden	66.9	III
III	Placer	37	A & B	Auburn-Collar	13.80	63TC4	C. W. Wood	J. N. Bidwell and J. N. Greene			III
IV	Marin	1-69	C & A	San Rafael-San Quentin	2.97	64WC1	Graufeld, Farrar & Carlin	M. C. Fesgate	D. N. Czekowicz	49.6	IV
IV	Contra Costa	14	A	Through Pinedale and Hercules	1.74	64TC2	Prentiss Paving Co.	E. E. Sorenson	L. G. Marshall	37.0	IV
IV	Sonoma	8	A & B	Fairville-Vineburg Jet.	7.28	64TC3	A. Teachert & Son	P. O. Harding	E. Carstad	31.3	IV
IV	San Mateo	68	A	San Francisco-South San Francisco	3.25	64TC1	H. W. Rohl	H. S. Payson	C. I. Largent	35.1	IV
IV	Marin	52	A	At Alto	0.65	64CN1	Graufeld, Farrar & Carlin	M. C. Fesgate	D. N. Sapp	42.6	IV
IV	Napa	8	B	Napa Wye-Solano County Line	2.81	24FC3	Frederickson & Watson	P. O. Harding	E. Carstad	32.7	IV
V	San Benito-Monterey	2	B	Highway of San Juan Bautista	1.1	25TC2	Wallace A. Dontaunville	J. C. Adams	G. A. Ullom	42.2	V
V	San Luis Obispo	33	B	Escondido-P. J. Ranch	5.67	25XC1	A. Teachert & Son	K. B. Grimes	G. A. Ullom	54.0	V
V	San Luis Obispo	23	B & C	1.7 miles W. of Shandon-East Boundary	15.88	65XC1	A. Teachert & Son	H. L. Cooper	G. A. Ullom & E. F. Carter	46.4	V
V	San Luis Obispo	2	B	San Luis Obispo-City Reservoir	1.00	65FC1	Ariss-Knapp Co.	P. E. Johnson		69.8	V
V	Santa Barbara	2	B	Los Alamos-0 1/2 miles North	1.83	25KC1	M. J. Bevanda	J. C. Adams		48.0	V
VII	Los Angeles	4	E	N. City Limits of Los Angeles-Newhall Tunnel	0.66	67FC4	Geo. Mitchell Co.	R. D. Kinsey	T. C. Peterson	51.8	VII
VII	Los Angeles	4	C	1/2 mile N. of Kelly's-1/2 mile N. of Sandberg's	0.98	67FC6	Gibbons & Reed	R. D. Kinsey	T. A. Roschery	60.0	VII
X	Solano	8	A	W. Boundary-2 1/2 mile W. of Cordella	2.24	616XC8	Frederickson & Watson	E. L. Crum	R. H. Lapp	62.6	X

PLANT OIL MIX

District	County	Route	Section	Limits	Length in miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
III	Placer	17	A	Roseville-Rocklin	2.46	08EC4	J. E. Johnston	E. J. Peterson	H. L. Townsend	42.9	III
VI	Kern	57	E & F	Bakersfield-11 miles East	10.95	06XC3	Force, Corrigan & McLeod	E. J. Peterson	C. L. Martin	34.2	VI
VI	Fresno	10	C	3 miles E. Patchfield Jet-Coalinga	6.50	06CC2	Asian Brothers	F. N. Hoem	C. L. Martin	10.9	VI
VI	Tulare	10	F	Three Rivers-Venona National Park	5.50	06CC2	Asian Brothers	F. N. Hoem	C. L. Martin	27.2	VI
VIII	San Bernardino	35	G, H	4 miles W. Hector-2 miles W. of Argo	13.65	08VC1	Allied Contractors, Inc.	G. E. Malkson	M. P. McDonough	27.4	VIII
VIII	San Bernardino	35	H & J	Yermo-Dunn	20.59	08VC1	Dillon & Boles	J. M. Hodges	R. M. Lindsey	23.0	VIII
VIII	San Bernardino	58	F & G	Daguerre-4 miles W. of Hector	21.41	08VC2	Dillon & Boles	O. B. Benkerhoff	F. H. Richardson	19.4	VIII
VIII	Riverside	64	C & D	9 miles W. of Hopkins Well-Black Butte	21.63	08VC1	Geo. Herz & Co.	Howard Noble and S. C. Baumbach	W. Ford	7.5	VIII
IX	Kern	23	B	Mojave-7 miles S. of Cinco	9.95	09VC3	Barlett & Mathews	H. M. Hansen		28.7	IX
IX	Inyo	23	I	Dutz Lake-Alameda Creek	8	09VC1	Southwest Paving Co.	H. M. Hansen		18.8	IX
IX	Inyo	23	K	Chowchilla-Cottonwood Creek	10.82	09VC1	G. W. Ellis	V. E. Pearson		13.0	IX
IX	Inyo	23	J	Chowchilla-Cottonwood Creek	9.30	09VC1	Southwest Paving Co.	V. E. Pearson		22.3	IX
IX	Kern	23	B	7 miles S. of Cinco-Cinco	7.26	09VC5	Southwest Paving Co.	W. Mathews		21.9	IX

ROAD OIL MIX

District	County	Route	Section	Limits	Length in miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
IX	Inyo	23	B & C	Tinnamaha Dam-Big Pine	6.71	99CS1	Monfort & Armstrong	J. N. Bidwell		8.7	IX

ARMOR COAT

District	County	Route	Section	Limits	Length in miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
II	Siskiyou	3	C	Klamath River-Ore. Line	14.15	22LC1	Jack Casson	R. C. Tunnelly		42.4	II

THE MAXIMUM CONSERVATION OF WATER WITH REFERENCE TO THE CALIFORNIA PLAN

(Continued from page 19.)

lieving existing emergencies, particularly supplying water to areas which have already overdrewn the present supply. In southern California there was proposed the importation of Colorado River water in a manner which is now under intensive study by the Metropolitan Water District of that area. In the Sacramento and San Joaquin valleys, otherwise known as the Great Valley, the plan contemplated storage of water in the northern watersheds, surplus to the ultimate future needs of that area, and its transportation to the deficient lands of the San Joaquin Valley several hundred miles to the south. In devising the transmission system a gravity canal was at first considered, but was found to be prohibitive in cost. From a diversion on the Sacramento River at the proper elevation to afford gravity delivery to the southern end of the San Joaquin Valley would require a canal very nearly 1500 miles in length, which would be in mountain or foothill country almost its entire distance. As a substitute a plan of allowing the water stored in the Sacramento Valley to flow after release down the Sacramento River to the delta area and to be pumped therefrom into the San Joaquin Valley, was investigated and found to present a superior solution. In this set-up the channel of the San Joaquin River would be used as a conduit and by a system of dams and pumping plants the Sacramento River water would be forced up the San Joaquin River against its grade to the desired elevation. This arrangement was found to be vastly cheaper than the gravity lay-out, both in capital and annual costs, and it also had many other advantages, such as more dependable water supply, elasticity of operation and freedom from legal and water right difficulties.

This engineering plan has not yet been completed in all of its details, but the conception has been presented. By-product power will be realized to its fullest extent and irrigation, saline control, navigation and flood control will be accomplished as an effect of its execution, as well as the furnishing of water for other purposes.

One item in the ultimate plan of interest is the construction of a dam or barrier across Carquinez Straits in San Francisco Bay, some miles below the junction of the Sacra-

mento and San Joaquin rivers. Various sites for such a dam were explored, varying from one to two miles in width and in water depth from 100 to 50 feet or less. After a thorough study it was decided that such a structure could be built, but at a cost of about \$50,000,000. Its construction is a necessary item ultimately. It would eliminate the salt water menace and would make possible the transfer of water into the San Joaquin Basin with a minimum of loss; however, it is not indispensable to such transfer for many years, as the salinity problem in the agricultural delta could be controlled by the wastage of sufficient fresh water to hold the salt water from the bay at a predetermined point.

The physical plan has taken fairly definite shape, and many of its main cost items are known. However, until the last year no study had been made nor conclusion reached as to its economic or legal feasibility, method of financing, nor of obtaining the necessary federal consent and justifiable participation. At the present time the completion of the engineering work is being carried out, as well as the economic and other items. Determination of the value of such a gigantic proposal is indeed a difficult matter and requires the combined services of engineers, economists, agriculturalists, attorneys, financiers and statesmen.

The technical studies, while of the greatest magnitude, are the most definite and susceptible of determination, the economic answer being far more difficult to get at with a reliable degree of accuracy. Such studies are proceeding, however, and it is expected that a conclusion as to the feasibility of the project or certain units thereof will be reached within a year. After taking all benefits into account if the plan is feasible, legal, financial and political plans for carrying it out will next come under study.

There is great public interest in California in this suggested plan, and general acceptance of the idea that the conception is sound and will come about in later years, if not at once. Great pressure is being exerted for an early start by the areas undergoing reduction in cultivated areas on account of lack of water. The state and the national governments have appointed commissions to investigate and report upon the whole subject and it is receiving wide attention from legislators, financiers, business men, farmers and considerable attention even from larger cities. The magnitude of the proposed work is illustrated by the cost estimates, which range from \$100,000,000 with the fewest number of units suggested to over

\$700,000,000 with the maximum which have been recommended for early consideration.

If such a plan is carried out under the direction of the state itself, and it does not seem possible for any other agency to successfully accomplish it, other questions of a state or political nature arise. California climatically and geographically is separated into several divisions. The northwest coast area with 25 per cent of the water supply of the state and only 2 per cent of the agricultural lands has no water problem and little interest in the situation. The Great Central Valley, with approximately 13,000,000 acres of land and 37,000,000 acre-feet of mean annual water supply, will require such a plan for its development, and it has furnished the main support for the investigations to date. Southern California with 20 per cent of the land and only 1 per cent of the water supply has more than half the population and the assessed valuation of the entire state and is undergoing a water shortage of such severity that relief is imperative. This section plans to import water from the Colorado River at a cost in the neighborhood of \$300,000,000. It is apparent that a conservation plan, carried out under state auspices, and partly or wholly by state bond issue, must assist all portions of the state in need and not be local in character. It is also apparent that to recommend a plan, sound from the engineering and economic standpoints, which will also properly take into account the various sections of the state in such a way as to be satisfactory to the voters of the entire state who must ultimately pass upon it, is indeed a problem of the first magnitude, which can be solved only by the cooperative and constructive efforts of all concerned. Wide vision, sound business judgment and complete and accurate information are essential to the success of such an undertaking.

U. S. RECLAMATION BOARD AIDS IN WATER STUDY

(Continued from page 15.)

The means for conserving available water. The means for conveying and distributing water to and over areas of deficient water supply.

The ability of lands to contribute to the cost of development.

The physical and economic feasibility of the plan.

The units of the plan worthy of first consideration.

Statistical Story Of U. S. Highways Is Told in Booklet

A statistical story of the growth of highway systems in the United States and in the world is recited in *Highways Handbook*, recent illustrated publication by the Highway Education Board.

"The building of the modern highway system," says Thos. H. MacDonald, chairman of the Board, in a brief introduction, "has no counterpart in the public works of any nation.

"The construction of the Panama Canal was a task of large magnitude; its completion a great national achievement; yet large as it was the contribution of the federal government alone to the construction of highways far outmeasures it, and the part of the federal government in the program of road improvement has been relatively small. The greater part of the work has been done by the states and their subdivisions.

"The story of this great constructive work wants no elaboration. The bare figures of miles built and money invested are impressive beyond need of added emphasis; and it is such an unembroidered story that is told by the facts and figures presented in this booklet."

Data and information used in the booklet are from government tabulations, the Board says, the United States Bureau of Public Roads and the automotive division of the Bureau of Foreign and Domestic Commerce being the principal sources of supply. The 97 pages of the handbook, the first comprehensive grouping of highway statistics into one volume, are divided into ten chapters, each treating of a separate phase of the subject.

One chapter is devoted to a general summary, an itemization of interesting features in connection with the subject. What is the longest paved road in the world; what state has the largest highway mileage; what is the shortest road and the most narrow street; what is the proportion of the United States highways to the rest of the world? These and a hundred other pertinent questions are answered in the section on "milestones."

For the student, the book is a treasure trove. Tables giving total road mileage, road income, and expenditures, and other related data, by years, by types, by states and by counties appear frequently in the booklet. The total road expenditure for 1928, for instance, was \$1,423,870,278, which is broken up into various subdivisions covering construction, maintenance, administration, purchase of equipment and bond interest.

Of the total 1928 highway income of \$1,566,946,170, 20 per cent was derived from motor vehicle fees, 18 per cent from gasoline taxes, 5 per cent from federal aid, 17 per cent from bonds, 27 per cent from general taxes and 13 per cent from miscellaneous funds. General taxes fall 2 per cent short of covering the cost of maintenance alone.

In the table on total mileage and total mileage surfaced, it is disclosed that of the 3,016,281 miles of rural roads in the United States, 69 per cent is under the supervision of local authorities, or those other than state and federal officials.

Average automobile receipts for highway improvement have increased steadily from year to year, the booklet shows, despite or perhaps because of the growing number of automobiles. In 1919, with a registration of 7,566,446 vehicles, the average receipts per

(Continued on page 31.)

Progress of Water
Resources Study



Progress in Flood
Control and Rec-
lamation

Review of April Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Adjudication of
Water Rights



Report on Dam
Inspections

WATER RESOURCES INVESTIGATION

SAN JOAQUIN VALLEY

Land Classification and Crop Survey.—All field and office work including mapping of land classification is complete. All field work and office compilations on the crop surveys are complete. Map delineating cropland areas yet to be made.

Ground Water Investigation.—A geological and hydrographic study of ground water storage reservoirs was initiated during the month. These studies will determine the location and capacity of these reservoirs and also the rate of absorption of surface applications. These items are very important in the distribution and utilization of the run-off of San Joaquin Valley streams south of San Joaquin River because they have important bearing on the size and operation of surface storage reservoirs for maximum utilization of the water resources of the southern San Joaquin Valley.

Main Supply Canals.—A paper location and field reconnaissance and cost estimates have been completed for all gravity canals from Feather River to Kern River and from American River to Mendota on the San Joaquin River. A location survey and preliminary cost estimates of Canal from Kings River to Kern County have been completed. The survey for a higher location of a canal from the San Joaquin River to Kings River which would deliver water to Kern River by gravity is 50 per cent complete.

SACRAMENTO VALLEY

Water Supply.—Estimates of the run-off of Sacramento River at Iron Canyon, Sacramento River at Kennett, Feather River at Oroville, Yuba River at Smartsville, Butte Creek, American River at Folsom and American River at Van Trent as would be impaired by ultimate upstream use in the mountain and foothill areas have been completed. Maps have been prepared showing the location of these mountain and foothill users.

Land classification.—Land classification and crop survey have been completed in the Sacramento Valley. This covered an area of 8,000,000 acres. The area covered in the past month includes lands in the foothill area along the west side of the valley from Vacaville to Redding together with lands in the northern end of the valley in Shasta and Tehama counties. Summaries have been prepared in the office of both crops and land classification by counties, together with summaries for irrigation and reclamation districts.

Water Requirements.—A study is now under way to determine the gross daily and consumptive use of water in the Sacramento Valley.

Surveys.—Additional surveys of the Fairview dam site on the Trinity River and complete surveys of the Camp Far West dam site and reservoir site on the Bear River have been made. A test pit has been started at the Iron Canyon dam site and bids have been called by the U. S. Engineer's office for three test tunnels at the Kennett dam site.

Engineering Advisory Committee.—An inspection trip was made by the Engineering Advisory Committee during the past month to dam sites on the Feather, Yuba and Bear rivers. This committee consists of the following engineers: F. C. Herrmann, J. B. Lippincott, Fred H. Tibbets, J. D. Calloway, Walter L. Huber.

Geologic Examinations of Dam Sites.—Geologic examinations and reports have been made by a geologist of dam sites on the Feather, Yuba and Bear Rivers.

SALINITY INVESTIGATIONS

During the past month the work on salinity investigations has been devoted entirely to office studies and analyses of the data collected during the past year. Substantial progress has been made on the analyses of the relation of salinity to stream flow and tidal action. Every effort is being made to complete the program of office studies and obtain final conclusions as to the behavior of salinity and complete the preparation of a report thereon by the middle of this coming summer.

Thirty-two regular salinity observation stations are being maintained continuously, covering the entire tidal basin of the upper bay and delta region. Samples are being taken and analyzed every four days at these stations. In addition, the drainage water at eight stations on several of the islands in the delta is being sampled and analyzed every four days.

SALT WATER BARRIER INVESTIGATION

Work on the salt water barrier investigation during the past month has been chiefly concentrated on an intensive survey of the industries within the area affected by the salt water barrier. The field work on the industrial survey was actually started on March 14 and has been prosecuted diligently since that date. A printed questionnaire which has been carefully prepared is presented to each industry by a personal representative from the State Engineer's office and the data are filled in on this questionnaire by the executives and engineers of the various industries. Thus far the industrial survey has been confined to the upper bay area including Contra Costa, Solano, Sonoma and Marin counties. It is possible that the survey will be carried at a later time into Alameda County. Work

has also been started on a survey of the agricultural development in the delta area. This survey will be extended into the marsh land and upland area tributary to the Suisun and San Pablo bays to include all of the agricultural area which may be affected by the proposed barrier.

On March 28 the Engineering Advisory Board on the Salt Water Barrier investigation, consisting of C. E. Grunsky, Thomas H. Means, George A. Elliott, A. Kempkey, Chas. D. Marx, C. T. Leeds, Geo. A. Atherton, met in the State Engineer's office in Sacramento and carefully reviewed the program of work and the operations and studies under way. A field trip was made by boat on March 29 inspecting all of the proposed barrier sites.

A cooperative investigation has been continued during the past month by the Department of Public Health, Bureau of Sanitation on an intensive study of sewage pollution and industrial waste and their effect on the proposed barrier. The State Fish and Game Commission of the Department of Natural Resources has continued work on their cooperative investigation of the fishing industry and the relation of the barrier thereto.

NAPA COUNTY INVESTIGATION

The water resources investigation of Napa County which is being carried on in cooperation with the county, is well under way. Permanent recording stations have been installed on Conn Creek at the mouth of the Canyon, and on Napa River near St. Helena and near Napa by which a continuous record of the flow of the streams at those points will be made available. Frequent measurements are being made also on Conn Creek at various points between the Canyon mouth and the confluence with Napa River for the purpose of ascertaining to what extent this is a rising or a losing stream, i. e., to what extent it is a contributor or a drain of ground water. And in order to ascertain the effect of stream flow, rainfall and diversions upon the ground water some eighty wells have been selected, scattered throughout the Napa Valley, in which frequent readings of water level will be taken.

SANTA CLARA INVESTIGATION

The investigation of water resources in Santa Clara County carried on in cooperation with the Santa Clara Valley Conservation District is also well under way. Stream gaging stations with continuous flow recorders have been established on Stevens, Alamos, Los Gatos, and Guadalupe creeks and occasional measurements are being made on those streams to ascertain the percolation in the stream channel at various sections. The fluctuation of ground water levels is being observed at approximately 240 wells.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Maintenance work on the flood control project has been mostly routine during this period. Preparations have commenced for irrigating the willow planting along the east levee of the Sutter By-pass. The drainage pumping plants along the Sutter By-pass levee have been in operation a considerable portion of the time.

The Dutton Dredge Company's dragline excavator has completed the enlargement of the West Intercepting Canal, and is now engaged in cleaning and enlarging the canals in the pumping plant No. 3 system.

A dragline machine operated by Robert P. Easley has completed cleaning the ditches of the No. 1 pumping system and is now proceeding to clean the main drainage canal from pumping plant No. 2 to Gilsizer Slough.

Repairs have been made to the flume crossing of the Sutter-Butte Canal Company over the West Intercepting Canal where it has been enlarged, and a new bridge is being constructed on the Wadsworth ranch made necessary on account of enlarging the West Intercepting Canal.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

All of the ten tree and steel retards on the right bank of the Feather River near Nicolaus have been completed. This work was undertaken in cooperation with the county of Sutter and was done under contract with the Pacific Coast Construction Company.

The eight current retards on the right bank of the Sacramento River below Knights Landing in Reclamation District No. 730 have been completed.

The cooperative work of bank protection on the left bank of the Sacramento River opposite Rio Vista, in cooperation with Brannan Island Reclamation District No. 2067 is practically complete. The work consisted of depositing rubble rock, maximum size 10 inches, along the bank for a distance of about 3000 feet, and approximately 2000 tons were placed.

Request has been made for cooperation with the Sacramento River West Side Levee District in the construction of three retards on the right bank of the Sacramento River, three miles below Colusa, at an estimated cost of \$8,100.

SACRAMENTO FLOOD CONTROL PROJECT

The work of by-pass clearing has been resumed. A force of approximately twenty-five men is working out of Sutter City in the Butte Slough By-pass, and the Robbins camp has been reopened with a crew of about thirty men. A. Mitchell is proceeding with clearing 100 acres under contract, which work is approximately 25 per cent complete. Preparation is being made to establish a camp of about twenty-five men on our floating equipment in the southern part of the Sutter By-pass.

The five contracts for clearing timber in the Feather River overflow channel above Marysville are continuing and are about 80 per cent complete. During the past period the timber surveys in this area have been completed.

In connection with the West Intercepting Canal, which was recently completed by the California Debris Commission, we are doing miscellaneous work in connection with various right-of-way agreements, consisting of fence and bridge construction, leveling spoil bank, and caring for irrigation and drainage.

A number of reports have been prepared on applications for the Reclamation Board.

RUSSIAN RIVER JETTY

Repairs to the gas shovel have been completed and the quarry work has been discontinued pending the completion of additional length of timber construction on the jetty. The driving crew and equipment have been organized and commenced work on March 31 with a crew of ten men.

SALINAS RIVER CHANNEL

A conference was held in the Attorney General's office on April 8 with Mr. Leon French, Colonel Bennett and a number of representatives of the various sporting organizations, in regard to securing right of

way for this channel. The matter is not yet clear, but a number of means were suggested. An attempt will be made to get this work under way as soon as possible. Examination of the site of the work and the immediate vicinity was made on April 13.

NAVARRO RIVER JETTY

As a preliminary to the completion of plans for this work, an examination of the site was made on April 8. It is planned to have the work under way some time during June.

DAMS

APPLICATIONS RECEIVED FOR APPROVAL OF DAMS BUILT PRIOR TO AUGUST 14, 1929

39 applications were received for approval of existing dams during this period bringing the total of such applications to 615. There remain about 70 dams for which applications have not been received. The great majority of these owners have been reached and with very few exceptions have expressed their willingness to file. Most failures to file have been due to ignorance of the law and every effort is being made to reach all owners.

APPLICATION FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION

Dam	County	Owner	Estimated cost
Allen	Sutter	Preston School of Industry	---- \$10,120
Lake Loveland	San Diego	Southern California Water Supply Company	----- 490,258

The Lake Loveland project is located on the upper reaches of the Sweetwater River in San Diego County. The purpose of this dam is to store 27,700 acre-feet of water for municipal, domestic, irrigation and industrial uses. It is to be a concrete arch with variable radius, 183 feet in height.

Consultants have been retained to review the plans for the Chatsworth project of the city of Los Angeles. This board consists of: J. B. Lippincott, Consulting Engineer of Los Angeles; Prof. Chas. D. Marx, Consulting Engineer, Leland Stanford Jr. University; Prof. John P. Buwalda, Consulting Geologist of the California Institute of Technology.

PLANS APPROVED FOR CONSTRUCTION

Dam	County	Owner	Estimated cost
Chenery	Contra Costa	California Water Service Company	----- \$300,000
Rock Creek	El Dorado	Arthur Rasor	----- 2,000

PLANS APPROVED FOR ALTERATIONS OR REPAIRS

Dam	County	Owner
Malibu Lake	Los Angeles	Malibu Lake Mountain Club

e. Inspections have been made on almost all privately owned dams situated in the lower altitudes, and are now being extended to dams at about 5000 feet elevation, which is the practical limit of accessibility. These are in the nature of preliminary investigations and a final inspection will be made after an analysis of each dam has been made in the office.

Arrangements have been made with the larger owners looking toward handling of each owner's dams by the same inspector as far as possible. This will eliminate duplication and tend to create better cooperation with all parties concerned.

WATER RIGHTS

ACTION ON APPLICATIONS TO APPROPRIATE WATER

During the month of March there were received 37 applications to appropriate water. Six applications were canceled, and 16 were approved. Fifteen permits were revoked.

Field work in connection with the inspection of projects under permit was recommenced on March 31 after the usual winter cessation of such activities. A revision of methods in this phase of the work has made possible a considerable reduction of effort and expense. By careful study of the annual progress reports and by letters to permittees in doubtful cases, inspections are avoided unless the project is abandoned or actually ready for license. Whereas, formerly approximately 25 per cent of all pending permits were inspected annually, this year less than 10 per cent of the pending permits will be inspected. Permits were hitherto inspected on an average of at least twice before disposed of by revocation or license, whereas, under the present system, at least three out of each four inspections result either in license action or revocation, thus disposing of the case.

PIT RIVER INVESTIGATION

The routine field work of the Pit River investigation was continued throughout the month. Staff gages were installed in the gravity ditches throughout the area to obtain an accurate record of diversions during the 1930 season. A snow survey along the several snow courses within the area was made on April 1st.

ADJUDICATIONS

Shasta River (Siskiyou County): This case has been submitted to the court, except for the Long Bell Lumber Company's Exception relative to the water rights on Beauglian Creek. This latter matter is still pending, awaiting action by the exceptors' attorney in securing a settlement of the points involved by an agreement among the water users.

Whitewater River (San Bernardino and Riverside Counties): The Whitewater River adjudication proceedings are pending in the Superior Court of Riverside County, by consent of all parties in interest, awaiting developments in regard to the proposed All American Canal from the Colorado River, the construction of which, if assured, will probably eliminate the remaining issues and open the way for a decree without further trial.

North Cow Creek (Shasta County): Submission of the final referee's report is being withheld pending negotiations now in progress which, if successful, will settle one of the important issues in the case out of court.

Oak Run Creek (Shasta County): Case pending in court awaiting entry of a decree in the North Cow Creek proceedings. A stipulation for consent judgment contingent upon the confirmation of certain findings in the North Cow Creek case has been signed by all parties in the Oak Run Creek case, and this stipulation is now before the court.

Claver Creek (Shasta County): Case pending in court and will be set on the calendar for hearing on the referee's report at an early date.

Butte Creek (Siskiyou County): This matter is pending in the Superior Court, awaiting action by the parties involved.

Emerson Creek (Modoc County): The Emerson Creek Court Reference proceedings were terminated

by a court decree entered by the Superior Court of Modoc County, on March 25, 1930. This decree established the water rights to the extent of 24.65 cubic feet per second, owned by twelve parties for irrigation and domestic use on approximately 1900 acres of land.

The Emerson Creek case was referred by the Superior Court of Modoc County on April 1, 1927. Engineering data were collected in the field throughout the 1927 season, and a tentative schedule of allotments was administered by a water master during the 1928 season. On March 19, 1929, at a meeting of the parties involved, a stipulation for consent judgment fixing a schedule of allotments, based upon the results of the trial distribution of 1928, was presented to and adopted by the water users. The court decree was entered in accordance with the provisions of this stipulation.

Los Alamos Creek (Santa Barbara County): A stipulation for consent judgment has been signed by a majority of the water users and is now being circulated among the remainder of them.

Davis Creek (Modoc County): A stipulation for consent judgment was submitted to the water users at a meeting held at Davis Creek on March 18. The stipulation was signed by all parties present, with the exception of two, and is now being circulated among nonresident water users.

Mill Creek (Modoc County): A proposed schedule of distribution for the 1930 season was submitted to and adopted by the water users at a meeting held on March 18. This schedule will be administered by a water master during the 1930 season, as a trial allocation of the waters of the stream.

Deep Creek (Modoc County): The Deep Creek case was referred to the Division by the Superior Court of Modoc County on March 22, 1930, under the procedure provided for in section 24 of the Water Commission Act. This case involves the rights of some 20 parties to the use of the waters of Deep Creek in Surprise Valley, Modoc County, for irrigation and domestic purposes on approximately 1200 acres of land. Field work on the investigation was begun on March 23, 1930, and is being conducted in conjunction with the water master service on the various streams in Modoc County.

WATER DISTRIBUTION

Davis, Emerson, Mill, Orel and Soldier Creeks (Modoc County): Water master service was begun on these streams for the 1930 season on March 19, and involves the distribution of water for approximately 11,000 acres of land.

Little Shasta River (Siskiyou County): Water master service commenced on April 1st for the 1930 season. An area of approximately 5000 acres of land is covered by the distribution of the waters of this stream.

Pit River (Modoc County): Water supervisor service was commenced on Pit River on April 1, 1930. This service consists of the supervision of all diversions from Pit River in Big Valley, in accordance with an agreement entered into by the Big Valley Water Users with the object of conserving water by the elimination of wastage through keeping the parties posted as to water supply conditions and causing them to divert in rotation during the critical period of the season. The resident engineer in charge of the Pit River investigation has been appointed Pit River Water Supervisor and will carry on the distribution work in conjunction with the Pit River investigation. Supervision will be maintained over diversions supplying water for the irrigation of approximately 10,000 acres of land.

IRRIGATION, WATER STORAGE DISTRICTS

During the month construction work in progress in the Banta-Carboma, El Dorado, Oroville-Wyandotte, Thermalito and West Stanislaus irrigation districts was inspected and conferences were held with officials of the first two districts named above. Visits of inspection were made to the Woodbridge, West Side and Hollister irrigation districts and to the proposed Richvale and Rio Seco irrigation districts. The Richvale and Rio Seco irrigation districts are located in Butte County and comprise 19,700 acres and 8000 acres, respectively, of rice lands now served by the Sutter-Butte Canal Company.

A number of proponents and opponents for the organization of the proposed Feather and Sutter irrigation districts located in the Sutter-Butte area and comprising 45,000 acres and 25,000 acres of land, respectively, visited the office and presented their views regarding the formation and organization of these districts.

The compilation of irrigation district financial and economic data has been continued through the present month.

California Bond Certification Commission.—The California Bond Certification Commission approved the private sale of \$2,500 par value of bonds of the West Side Irrigation District for construction work necessary in the development of the project; also, private sale of bonds of the Banta-Carboma irrigation district in the amount of \$6,000 par value and approval of expenditures by this district in the amount of \$5,760 for the development of the project.

Approval of change of plans was granted the El Dorado Irrigation District.

WATER RESOURCES COMMISSIONS

The fourth meeting of the Joint Legislative Committee and the Hoover-Young Commission considering the water resources of California convened at the Municipal Auditorium, Oakland, California, at 10 a.m. on April 8. The session continued throughout April 8 and 9.

The fifth meeting of the Joint Legislative Committee and the Hoover-Young Commission, called as an emergency meeting at Hotel Oakland at 10 a.m., April 16, presented and discussed with Dr. Elwood Mead, Commissioner of the United States Bureau of Reclamation, the water resources problems of California.

A newspaper writer in the *Chicago Tribune* has the following to say about the practice of driving through traffic signals:

"When the President rides out on business, he rides through traffic signals, and the citizens who recognize him lift their hats if he isn't past and gone before they can uncover. But of recent years, in New York and Chicago anyway, this privilege of riding through traffic has been accorded all local dignitaries above the rank of bailiff of the municipal court and to a great variety of visiting orchestra leaders, ecclesiastics, flag pole sitters and channel swimmers, so perhaps it shouldn't count as a distinctive presidential prerogative here."

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

ACCIDENT FIGURES ARE COMPILED

The annual report of motor-vehicle accidents has been completed for the year 1929 by the Bureau of Research, Statistics and Traffic Safety. There were 26,921 accidents reported to the division for the year 1929, resulting in death to 2,244 persons and injury to 35,443. This is an increase of 368 deaths, or 19.6 per cent over 1928. It is estimated that approximately 20 per cent of this increase, representing from 73 to 74 deaths, is statistical, due to the improved authenticity of reports.

Provisional figures received to date for January and February indicate a probable decrease under the corresponding period of 1929. In view of the fact that an increase of over 10 per cent is apparent for the United States during the same period this year, according to information received by the California Highway Patrol, it appears that the accident situation has been somewhat improved in California.

SUSPEND LICENSES FOR JUDGMENTS

Since January 1, the Division has been busy acting upon certified copies of judgments sent to us in accordance with the provisions of section 73 (g), which makes it mandatory upon the division to suspend any operator's or chauffeur's license and all registration certificates and license plates of any person who fails to satisfy a judgment rendered against him for property damage or personal injuries caused by an automobile within 15 days after same has become final. To date 141 cases have been reported. Suspension of licenses has been made in 51 cases, which affected 59 persons. The remaining number are being worked on, and as soon as they are complete as to form formal notices will be sent the judgment debtors.

ARREST CAUSES ARE CLASSIFIED

During March the California Highway Patrol established night patrols in Napa, Sacramento, Marin, Alameda, Placer, Merced and Fresno counties. Throughout the state the officers stopped 17,170 vehicles, and arrested 5221 persons. Those arrested were charged as follows:

Reckless driving.....	129
Drunken driving.....	74
Speeding.....	347
Faulty lights.....	3550
Rules of the road (not including above noted violations).....	445
Miscellaneous violations.....	560
Truck violations.....	116

The total fines reported were \$26,965.55, and the officers covered 481,681 miles of highway in their patrol work.

REGISTRATION FEE COLLECTIONS

The total registration fees collected for the first quarter of the calendar year 1930, are \$8,006,260.59, and cover the registration of the following number of vehicles:

Automobiles and commercial vehicles under 3000 pounds.....	1,742,030
Pneumatic trucks.....	66,978
Solid trucks.....	13,837
Pneumatic trailers.....	27,161
Solid trailers.....	8,200
Motorcycles.....	6,934

In addition to the above, 29,365 automobiles and trucks, 3720 trailers, and 776 motorcycles have been registered under exempt license plates.

For the first quarter of 1930, nonresident motorists secured 15,800 nonresident permits. This number is almost doubled by the nonresident motorists who have applied for California registration, which totals 31,141.

INFORMATION SOUGHT FROM RECORDS

Proof that the records of the division are a great source of information is given in the fact that during January and February, 16,657 letters were received, requesting information on 24,114 registrations. These requests were received from police departments, commercial businesses, collection agencies, insurance and finance companies, attorneys and individuals. Now that our files are complete this bureau's work will increase greatly for the next two or three months.

NEW TRAFFIC OFFICERS NAMED

Following are appointments to various counties:

GLENN COUNTY—L. R. Linville.

NEVADA COUNTY—Edward C. Hunt.

PLACER COUNTY—Irvin D. Elliott and G. C. Herring.

SACRAMENTO COUNTY—O. R. Latta.

SAN MATEO COUNTY—Louis E. Rinkel.

STATISTICAL STORY OF U. S. HIGHWAYS IS TOLD IN BOOKLET

(Continued from page 26.)

car were \$8.68, while ten years later, with a registration in excess of 24,000,000 automotive vehicles, the average income per car was \$25.63.

A chapter on federal aid operations, falls second in the booklet, while separate chapters are allotted to the state highway systems, and to county and local activities.

World highway mileages afford a vivid comparison of the growth of automotive transportation in the United States, statistics for 137 nations and autonomous countries being presented.

A chapter on highway uses offers an interesting study, while another on uniform warning and direction signs, portrayed in colors, gives the signs recommended for use by the American Association of State Highway Officials.

Chapters on highway films available, on bibliography, and finally on organizations interested in highway development complete the study, with an explanatory note outlining briefly the activities of the Highway Education Board.

According to the Ohio Farm Bureau Mutual Automobile Insurance Company, automobile drivers between the ages of 18 and 20 are the greatest hazard to traffic. This finding was made on an examination of 2000 traffic accidents.

"I advertised that the poor would be welcome in this church," said the minister; "and after inspecting the collection I see that they have come."

THE MODERN EL CAMINO REAL

(Continued from page 7.)

of way approximately 35 feet north of and parallel to the center line for a distance of 0.6 mile before joining Campbell Creek, which flows to the north. This channel was discontinued and filled up, giving a full 12-foot shoulder width with flat slopes to or near the right of way line. Through agreement with the property owners a new channel was extended almost due north from the highway about $\frac{1}{2}$ mile, at which point it empties into a deep borrow pit from which material was taken to fill the original channel along the highway. Approximately 700 feet beyond this borrow pit a levee extending in a northeasterly direction was thrown up for a distance of 1650 feet, at which point it was directed southeast for 740 feet, this point being approximately 2000 feet north of the highway about half way between Calabasas and Campbell creeks. From this point, in a northeasterly direction, a new channel was cut across to a junction with Campbell Creek approximately 3000 feet north of the highway. During the summer months Calabasas Creek is dry, but in the rainy season water flows down the new channel to the borrow pit, it now acting as a reservoir which tends to replenish the supply of ground water to adjacent property. During heavier rains this reservoir overflows and is contained within the levees around the low-lying contiguous land. This results in a deposit and gradual upbuilding of light silt—a feature desired by the property owner. In time of excessive flood the water finds outlet through the new channel beyond. Most of the water settles and is conserved. The silt deposit each spring is plowed into the heavy soil with entirely beneficial results. The past season saw a deposit of several inches. Thus the state was relieved of further responsibility in maintaining 0.6 mile of Calabasas Creek, and was enabled to obtain a highway of standard section with adequate provisions for future widening. This work was done under Day Labor Work Order under informal bid contract by N. M. Ball of Porterville, who was also the general contractor on this section between Sunnyvale and Santa Clara. C. F. Price was the resident engineer. Construction cost of this section was approximately \$227,000.

The second section of this 14 miles now under construction extends from 1000 feet north of the county line at San Francisco Creek in San Mateo County to San Antonio

Road in Santa Clara County. This has a net length of 4.36 miles though it has a gross length of 4.74 miles, there being an exception of 0.38 mile through the town of Mayfield.

This project extends through the combined City of Palo Alto and Mayfield. The details, both as to right of way and construction, are rather involved due to present structures, city pavement, curbs and sidewalks, and intersecting streets. Several improvements in alignment are being effected by acquisition of right of way largely on one side in acquiring the new 100-foot width without discarding any of the original right of way. One such change extends from the beginning of the project for a distance of 0.7 of a mile, removing reverse curves and unsightliness from alignment, and provides for widening the 60-foot span arch bridge over San Francisco Creek bridge on one side only to a 76-foot roadway width including one 6-foot sidewalk.

Two other slight changes are effected at curves in the vicinity of Yeguas Creek to make it necessary to widen the structure on one side only, and the approach to the important county road intersection at San Antonio avenue near the end of this project.

A more important revision in location is made about $3\frac{1}{2}$ miles from the beginning of this job, where a 300-foot radius curve is eliminated. From a right of way standpoint, this change involves a heavy expenditure, including moving of buildings, in settlement with one party only, "Mammy's Shack," of more or less local fame.

The original pavement was constructed to a 20-foot width of 5-inch waterbound macadam with $1\frac{1}{2}$ -inch topeka top and 3-foot oil macadam shoulders, though through the town of Mayfield, 6-inch concrete, 24 feet in width, was placed, under contract in 1911, excepting the first 1400 feet which was placed this same year by state forces. The present contract calls for $4\frac{1}{2}$ inches of Type "A" asphalt concrete surface laid in two courses over the present pavement, widening over 6-inch compacted rock base to 40-foot width, with 8-foot shoulders from the beginning of the project to Mayfield. Through Mayfield, excepting the 0.38-mile business district, 40 feet of 8-inch to 10-inch concrete in four 10-foot strips is being placed over a 4-inch compacted rock base. The balance of the project includes about one mile of 8-inch to 10-inch thickness of concrete, 30 feet wide, and one mile of $4\frac{1}{2}$ -inch asphalt concrete Type "A" in two courses on present 20-foot pavement and 10-foot width of 8-inch to 10-inch thickness

Class "A" concrete over 4-inch compacted rock base on the left side.

Right of way involved 103 ownerships out of which 6 suits were necessary, one of which is a friendly suit against Stanford University, this being the only legal way title could be obtained. The widening of right of way through the town of Palo Alto was facilitated by the abandonment and removal of the tracks of the Peninsula Railway Company for approximately two miles. The removal of these tracks from the highway right of way is the result of negotiations carried on with the railway company over a period of six years or more, and is considered an achievement of note, for it is felt that there is no justification for the location of an electric railway inside a state highway right of way.

It is necessary to carry all traffic through this job since the only detours available are Palo Alto streets, which would require through traffic to cross twice at grade the main line of the Southern Pacific Railway, where over 70 fast trains pass daily. The completion date for this contract between Palo Alto and San Antonio Road is September 12, 1930. Contract allotment is approximately \$311,000, which includes the construction of the San Francisquito Bridge for which a special allotment of \$20,000 had been budgeted. Hanrahan Company of San Francisco is the contractor, and C. F. Price the resident engineer.

The final and center link of this 14-mile section from Palo Alto to Santa Clara is 4.89 miles in length without exceptions and extends from San Antonio Avenue to Sunnyvale.

This project involves but one line change—that at Anzini's Corner—where it is proposed to replace the existing 400-foot radius curves reversing on 135 feet of tangent, with two 2000-foot radius curves, reversing on 350-foot tangent. It is planned to make park areas of the two triangular pieces of property between the old and the new locations at this change. The present pavement was constructed 20 feet in width in 1913 and 1914, and consists of a 1½-inch topeka top over a 5-inch water-bound macadam base for the first 2½ miles of this section, the balance being a 1½-inch topeka top over a 4-inch concrete slab.

The present plans are for a graded roadbed 50 feet in width, a pavement 30 feet in width throughout in a full 100-foot right of way. A 4½-inch asphalt concrete Type "A" surface laid in two courses will be placed on the existing 20-foot pavement throughout, excepting through the line change at Anzini's Corner, where a 30-foot width of 8-inch to 10-inch thickness concrete is to be placed over a 4-inch

compacted rock base. Widening is to be effected from the beginning of this project to the line change at Anzini's Corner on the left side, approximately one mile in length, by placing a 10-foot strip of concrete Class "A" 8 inches to 10 inches thickness over a 4-inch compacted rock base. Beyond the line change for the balance of the project, this widening of similar construction will be on the right side of the existing pavement.

This strip of highway passes through the town of Mountain View, where city lots of 25-foot frontage are involved. Due to this fact, 155 parcels and owners must be dealt with. Right of way negotiations also involve the moving of about 40 buildings, some half dozen service station pump installations and many irrigation conduits, in addition to about 20 ornamental gate posts and columns and the usual fence.

The construction contract will call for removing and replacing about 8000 feet of concrete or iron irrigation pipe from 8 inches to 12 inches in diameter, widening Stevens Creek 20-foot span arch bridge on both sides to a completed 76-foot roadway width, and replacing the Permanente Creek 12-foot span arch, which was built by the county in 1899, with a concrete box to be constructed inside the present arch to give full 76-foot roadway width.

A good detour is available for the entire job during construction; but, due to the heavy urban local settlement, this is not considered practicable; so it is planned to carry full traffic through the job during construction.

Right of way negotiations for this section are progressing nicely, and it is expected that it will be advertised shortly.

It is expected that the public will be enjoying the fully reconstructed and otherwise modern improved El Camino Real, between Palo Alto and Santa Clara, not later than the spring of 1931.

AIN'T IT THE TRUTH

"When you find a public official who pleases everybody, there will be a glass plate over his face and he will not be standing up."

A backwoodsman one day found a mirror which a tourist had lost. "Well, if it ain't my old dad," he said as he looked in the mirror. "I never knew he had his pitcher took."

He took the mirror home, stole into the attic to hide it, but his actions did not escape his suspicious wife. That night, while he slept, she slipped up to the attic, and found the mirror. "I'm-m," she said, looking into it. "So that's the old hag he's been chasin'."—*The Dravo Bulletin*.

THE SCIENCE OF MECHANICAL VENTILATION

(Continued from page 11.)

runs into a considerable amount and also since the Assembly Hall will be unused during the warmest summer weather due to the vacation period, the installation at the Chico College has been designed to use the upward system.

To force the air into the building, large fans or blowers are utilized. The installation at Chico contains four such fans, one supplying air to the main floor and another supplying air to the balcony. One main exhaust fan removes the air from the seats under the balcony and also from grilles in the ceiling over the balcony and main floor. The other fan is a small one for separate ventilation of the motion picture projection room. This air is removed from the building through ornamental plaster grilles located in the ceiling over the balcony and main floor, and also through metal grilles located in the portion of the ceiling under the balcony. Removal of air from the space occupied by the seats under the balcony is very necessary, otherwise, this space would tend to become pocketed with dead air. The exhaust air is subsequently discharged to the outside. To create a slight pressure in the theater, the capacity of the exhaust fan is somewhat less than the supply fans. The slight pressure is necessary to prevent cold draughts from entering from the outside when the theater doors are opened.

To cool and change the air, a saturating or cooling type air washer is provided. This piece of equipment serves the double purpose of cooling and washing the air removing about 95 per cent of the dirt in suspension. The fresh air, entering the building through the fresh air intake, is drawn through the washer by the fans and then discharged over heaters to the plenum space under the main balcony floor, and enters the building through mushrooms located under the seats. The air washer consists essentially of a number of spray nozzles, a metal housing and water tank, and a pump to recirculate the water. There is also provided in the air washer a number of staggered plates, called eliminator plates, designed to separate the air from any water or spray after it has passed through the nozzles. The spray nozzles are similar in construction to the type of nozzle used for lawn sprinkling. The washer for the Chico Assembly Hall is to be equipped with 156 nozzles and the pump circulates 520 gallons per minute. The air, passing through the fine mist-like spray created by the nozzles, is cooled by evaporation much the same as a water bag, hung on the outside in moving air, keeps the contents cool although the air surrounding it may be exceedingly warm. This apparent phenomenon is caused by extraction of heat by evaporation and is made possible by the fact that air has two temperatures, a dry bulb temperature which is the temperature one observes on the ordinary thermometer, and a wet bulb temperature. The wet bulb temperature is obtained by covering the mercury bulb with a small piece of cloth which is then moistened with water and whirled or placed in moving air of the same temperature until the reading becomes stable. Unless the air is saturated with moisture, as for instance a fog, the wet bulb temperature is always lower than the dry bulb. The difference between the two indicates the relative humidity.

Recent research by the United States Bureau of Mines and the United States Bureau of Public Health, in conjunction with the American Society of Heating and Ventilating Engineers, has shown that there are

three important factors which go to make up the effective temperature or create a comfortable feeling; namely, dry bulb temperature, wet bulb temperature and air motion. The first two have already been described. Air motion, an example of which is the ordinary desk fan, gives a feeling of coolness although it does not lower the temperature of the air surrounding it. This coolness is caused by increased evaporation of moisture on the surface of the skin, lowering the temperature; furthermore, the lower the humidity of the air of corresponding temperature, the greater the feeling of coolness due to increased evaporation. Air of high humidity is saturated with moisture and in such a state, air motion is of little or no importance in so far as cooling is concerned. That is the reason one reads of numerous fatalities following an eastern heat wave where a temperature of only 90 degrees Fahrenheit is accompanied by high humidity. It has been determined that 70 degrees Fahrenheit and 40 per cent humidity produces the greatest feeling of comfort to the normal person at rest.

As a rule, California enjoys low humidity, or dry air, especially so in the interior valleys. This provides fairly satisfactory cooling of the air by the washer method. A temperature of 100 degrees Fahrenheit at 20 per cent humidity, a condition common in the summer time in the interior valleys, is far more comfortable than 90 degrees and 70 per cent humidity common in the eastern states.

With a saturating type washer and cooler such as is to be installed at Chico, air entering the washer at 100 degrees Fahrenheit and 20 per cent humidity, would leave the washer and enter the Assembly Hall at about 60 degrees Fahrenheit, saturated with moisture. Expansion of the air after it enters the room, caused by bodily and external heat, raises the temperature slightly and lowers the humidity. Thus a comfortable condition is maintained in the building.

If it were not for the enormous amount of cold air forced into the building for ventilating requirements, very little heating would be necessary. To heat this cold air in the winter time, necessary heaters are provided similar in construction to the ordinary steam radiator, only many times larger. A metal casing is provided around the heaters and the air is forced through by the fan or blower. Steam for supply to the heaters is obtained from the central heating plant of the college at a pressure of 75 pounds per square inch and reduced to 10 pounds by a pressure reducing valve. The air passing through the heaters is warmed to approximately 70 degrees Fahrenheit. Inasmuch as the balcony tends to become warmer than the main floor, due to the ability of heat to rise, separate heaters are provided for the balcony and main floor.

To prevent overheating, due to fluctuation of temperature outdoors, a system of temperature control is provided. Two thermostats are provided, one for the balcony and one for the main floor. A thermostat is a small sensitive device about 4 inches high and 2 inches wide mounted on the inside wall of the theater, usually placed approximately 5 feet above the floor. It works on the well-known principle of metal to expand or contract due to changes in temperature. Thus this principle is used to actuate a small valve in the thermostat controlling the supply of compressed air to the diaphragm operated valves in the steam supply to the heaters. Compressed air is furnished by a small compressor in the fan room and is used as the motive force to operate the diaphragm valves. Thus, if the room becomes too warm, the thermostat located in the theater shuts off the steam and if the room becomes too cold, it opens the valves to admit steam to the heaters.

State Highway Progress Reports

IMPERIAL COUNTY

San Bernardino-El Centro Route—Rapid progress is being made on the A. M. Peck Company paving contract from Brawley to a point four miles west of Westmoreland. The Westmoreland end of this project was completed first to offer the least inconvenience to traffic.

El Centro-San Diego Route—R. E. Hazard has started work on pavement widening and resurfacing from Dixieland to Seeley. A contract has been awarded to Basich Bros. for paving from Myers Creek bridge to three miles west of Coyote Wells.

El Centro-Yuma Route—A. M. Peck Company has started work on the drainage and irrigation structures between El Centro and Holtville. A 20-foot pavement will be constructed on this project.

LOS ANGELES COUNTY

A contract has been awarded to Ben F. Dupuy for oiling shoulders on the Roosevelt Highway between the westerly boundary of Los Angeles County and Santa Monica.

The contract for a line change immediately north of the Newhall Tunnel has been awarded to McCray Co. This contract is approximately one mile in length and is on much better alignment than the present highway. It is expected that this contract will be completed next June.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of roadbed was awarded to H. W. Rohl Company on August 14th. Work is rapidly nearing completion and it is expected that this contract will be completed by June 15th.

The second contract on the La Canada-Mt. Wilson Highway for grading $1\frac{1}{2}$ miles of highway was awarded to T. M. Morgan Paving Company on January 27, 1930. This extends northerly from the end of the H. W. Rohl contract. This contract will probably require more than a year to complete.

A contract for paving the Newhall Alternate with Portland cement concrete, 30 feet wide, has been awarded to Jahn & Bressi. Grading of this section has just been completed by Le Tonnneau & Lindberg. The new location is on greatly improved alignment and eliminates Saugus, Newhall and the Newhall Tunnel from the Ridge Route. This section is 8.6 miles long. Paving will probably be completed by next September.

A contract for grading and paving a line change near Liberty School, four miles west of Calabasas, was awarded to the Will F. Peck Company January 18, 1930. This line change eliminates several bad curves and improves the grade. Grading work is now in progress. It is expected that this contract will be completed next August.

A contract for grading a 38-foot roadbed on the first section of the Alternate Ridge Route from Castaic School to Canton Creek was awarded to H. E. Doering, von der Hellen and Pierson on February 25, 1930.

This section is 7 miles in length and will probably require more than a year to complete.

Surveys are in progress on the rest of this route which will be a saving of more than seven miles in distance over the present Ridge Route.

LOS ANGELES-VENTURA COUNTIES

A contract for oil mix shoulders between Calabasas and Conejo Summit has just been completed by the Southwest Paving Company. There is now a 24-foot width of surfaced highway the full length of this contract.

ORANGE-LOS ANGELES COUNTIES

A contract for oiling shoulders between Galivan and Irvine and from Fullerton to Leflingwell Ranch in Los Angeles County has been awarded to G. M. Duntley.

ORANGE COUNTY

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90 to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Maceo Construction Company. When this work is completed the pavement will be 30 feet wide for the entire distance. It is expected that this work will be completed by next September.

RIVERSIDE COUNTY

Riverside-Ontario Route—A contract has been awarded to Matich Brothers for the construction of the pavement of the undergrade crossing under the Union Pacific tracks at Wineville. The railroad bridge work is practically completed.

SAN BERNARDINO COUNTY

Old Trails Highway—Contractors Gist and Bell have completed the grading contract from Alray to the Summit of Cajon Pass and the road has been opened to traffic. This improvement is over a new location on which the alignment has been improved and the distance materially shortened. This improvement will reduce the accident toll on this road and afford a new sense of security to the motorist driving over it. When weather conditions become favorable the road surface will be oil treated.

The New Mexico Construction Company are laying plant mixed oil treated surfacing on their two contracts extending from two miles west of Argos to six miles east of Auboy.

Arrowhead Trail—The George Herz Company is making substantial progress in laying oil treated surfacing on their contract from Barstow to Yermo.

Crest Route—Lewis Construction Company has started clearing the right of way on their grading contract between four miles west of Running Springs Park and Squirrel Inn. They plan to clear and burn all the brush immediately to avoid the fire hazard which would occur if the brush were burned later in the season.

A contract has been awarded to W. H. Rohl Company for grading from the Pass between Devils Canyon and Waterman Canyon, a distance of two miles down Waterman Canyon. This project will eliminate most of the heavy grades and switch backs in the upper end of Waterman Canyon. The clearing has been done and actual grading started.

SAN DIEGO COUNTY

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 46-foot graded roadbed. It is expected that this contract will be completed by June 1, 1930.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. It is expected that this contract will be completed next June.

A contract for grading 2.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. This section is on the San Diego-El Centro Highway. Rough grading is completed and concrete paving is now in progress. It is expected that this contract will be finished by June 15, 1930.

A contract for grading a 30-foot roadbed between Miller Creek and Tecate Divide on the San Diego-El Centro Highway was awarded to Monarch & Breen on August 17, 1929. This work is rapidly nearing completion and should be finished by May 15, 1930.

A contract for oiling the shoulders on various stretches aggregating approximately 35 miles between San Diego and Myers Creek Bridge on the San Diego-El Centro Highway was recently awarded to the Gilmore Oil Company.

Another contract for oiling the highway shoulders between Oceanside and the Orange County line has been awarded to G. M. Duntley.

VENTURA COUNTY

A contract has been awarded to California Road Oil Service Company for oiling shoulders from Camarillo to Ventura and from Ventura to Seacliff.

IMPROVEMENTS THROUGH APRIL AWARDS

RED BLUFF-SUSANVILLE LATERAL—Reinforced concrete girder bridge 105 feet long across the North Fork of the Feather River at Chester in Plumas County. This bridge consists of three 35-foot spans on concrete pile bents, and is located within the limits

of the grading and surfacing project now under way on this road between Morgan Springs and Lake Almanor. Contract awarded to A. T. How of Santa Rosa for \$10,900.

PACIFIC HIGHWAY—In Yuba County, paying through Wheatland with Portland cement concrete 0.9 of a mile. Grading of roadbed 36 feet wide and paving 20, on realignment, eliminating the right-angle turns in this town. Contract awarded to C. W. Wood of Stockton for \$31,296.

MOTHER LODGE COUNTRY—On this lateral in Calaveras County a reinforced concrete girder bridge across Calaveritas Creek is being built. This is situated about 3 miles south of San Andreas. Contract awarded to George J. Ulrich Construction Company of Modesto for \$18,037.

COMPLETION OF CONTRACTS

RED BLUFF-SUSANVILLE LATERAL—Contract for surfacing with untreated crushed gravel or stone and stockpiling screenings between Susanville and two miles west of Milford in Lassen County, covering 19.4 miles, and at an approximate cost of \$48,000, has been completed and accepted. Hein Bros. & Chittenden of Napa were the contractors.

OROVILLE-QUINCY LATERAL—Contract for grading roadbed and placing crushed rock surfacing between Oroville and the Feather River in Butte County, distance about 4.1 miles, at an approximate cost of \$181,400, has been satisfactorily completed and accepted. Arris-Knapp of Oakland were the contractors.

CARMEL-SAN SIMEON HIGHWAY—Construction of a bridge across Villa Creek on this highway in Monterey County, at an approximate cost of \$20,000, has been accepted. H. C. Whitty of Sanger was the contractor.

COAST ROUTE—Contract for constructing a graded roadbed and placing asphalt concrete pavement between Chualar and Salinas for about 10.3 miles in Monterey County, at an approximate cost of \$262,300, has been satisfactorily completed and accepted. Peninsula Paving Company of San Francisco was the contractor.

REDWOOD HIGHWAY—Contract for constructing a bridge across San Antonio Creek on this highway on the Marin-Sonoma County line, at an approximate cost of \$20,000, has been completed and accepted. McDonald & Maggiora of Sausalito were the contractors.

VALLEY ROUTE—Contract for grading roadbed and placing asphalt concrete pavement between south-erly Tulare County boundary and Pixley has been accepted. The Valley Paving Company of Visalia was the contractor.

SAN BERNARDINO-BARSTOW ROUTE—Contract for the construction of a bridge in San Bernardino County near Cajon Station at an approximate cost of \$13,100, has been accepted. Pittman & Hippenstiel were the contractors.

HIGHWAY BIDS AND AWARDS For Month of April

CALAVERAS COUNTY—Reinforced concrete girder bridge across Calaveritas Creek, about 3 miles south of San Andreas, consisting of one 60-ft. span on

concrete piers and six 30-ft. spans on concrete bents and abutments with rubble masonry wing walls. Dist. X, Rt. 65, Sec. B. Peter McHugh, San Francisco, \$21,131; Fredrickson & Watson Const. Co., Oakland, \$20,917; M. B. McGowan, San Francisco, \$22,185; O. G. Ritchie, San Jose, \$20,523; N. M. Ball, Porterville, \$21,079; Jacobs & Pattiani, Oakland, \$20,868; Geo. G. Wood, Fresno, \$18,826; Bodenhamer Const. Co., San Diego, \$19,689. Contract awarded to George J. Ulrich, Modesto, \$18,037.

LOS ANGELES COUNTY—Between the westerly boundary and Santa Monica, about 26.5 miles to have heavy fuel oil furnished and applied to shoulders. Dist. VII, Rt. 60, Secs. A, B. California Road Oil Co., Los Angeles, \$11,326; G. M. Duntley, Los Angeles, \$10,258; Gilmore Oil Co., Los Angeles, \$11,148. Contract awarded to Ben L. Dupuy, Los Angeles, \$10,081.

MODOC COUNTY—Two timber bridges, one across North Fork of Pit River about 3½ miles NE. of Alturas, and one across Shields Creek channel change about 4 miles NE. of Alturas. Dist. II, Rt. 28, Sec. C. M. B. McGowan, San Francisco, \$16,772; R. B. McKenzie, Red Bluff, \$15,402. Contract awarded to Smith Brothers Company, Eureka, \$13,875.

PLUMAS COUNTY—Reinforced concrete girder bridge across the North Fork of the Feather River at Chester, consisting of three 35-ft. spans on concrete pile bents. Dist. II, Rt. 29, Sec. A. M. B. McGowan, San Francisco, \$14,024; J. P. Brennan, Redding, \$12,263; R. B. McKenzie, \$12,968. Contract awarded to A. T. Howe, Santa Rosa, \$10,990.60.

SANTA BARBARA COUNTY—Buckhorn Creek to second crossing, Cuyama River, about 15.1 miles in length, apply heavy fuel oil on roadbed. Dist. V, Rt. 57, Sec. B. Bradley Truck Co., Santa Maria, \$4,297; Ben F. Dupuy, Los Angeles, \$4,629; A. Teichert & Son, Inc., Sacramento, \$6,215. Contract awarded to Gilmore Oil Co., Ltd., Los Angeles, \$4,185.72.

SANTA BARBARA COUNTY—Between Elwood overhead crossing and Goleta, and between Carpinteria and Rincon cutoff, about 65.5 miles oiling. Dist. V, Rt. 2, Secs. G, I, K, H. Seaside Oil Co., Summerland, \$4,366; Gilmore Oil Co., Los Angeles, \$5,988; California Road Oil Service Co., Los Angeles, \$4,867. Contract awarded to Bradley Truck Co., Santa Maria, \$4,130.

SAN BERNARDINO COUNTY—Between Bartstow and the Kern County line, about 37.5 miles in length, furnishing and spreading fuel oil on roadway. Dist. VIII, Rt. 58, Secs. A, B, C, D. Gilmore Oil Co., Ltd., Los Angeles, \$8,430; Leonard C. Pulley, Long Beach, \$8,861; Basalt Rock Co., Inc., Napa, \$8,957; California Road Oil Service Co., Los Angeles, \$8,957; Ben F. Dupuy, Los Angeles, \$10,969. Contract awarded to G. M. Duntley, Los Angeles, \$8,047.20.

SAN DIEGO AND IMPERIAL COUNTIES—Various locations comprising about 35.4 miles in all, to have heavy fuel oiling applied to shoulders. Dist. VII, Rt. 12, Secs. B, C, D, E, F, G, H, A. California Road Oil Service Co., Los Angeles, \$23,031. Contract awarded to Gilmore Oil Co., Los Angeles, \$22,165.40.

YUBA COUNTY—Through Wheatland, about 0.9 of a mile to be graded and paved with Portland cement concrete. Dist. III, Rt. 3, Sec. A. Basich Brothers Construction Co., Los Angeles, \$23,441; Mathews Construction Co., Sacramento, \$25,604. Contract awarded to C. W. Wood, \$31,296.50.

The red light is the place where you catch up with the driver who passed you at fifty miles an hour eight or nine blocks down the line.—Detroit News.

WATER APPLICATIONS AND PERMITS

Applications for permit to appropriate water filed with the State Department of Public Works, Division of Water Resources, during April, 1930.

MENDOCINO COUNTY—Application 6615. Hooper Bros., Valley Oaks Ranch, Ukiah, for 1.5 c.f.s. 10 acre-feet from unnamed winter drainage creek tributary to East Branch of Russian River to be diverted in Sec. 26, T. 16 N., R. 12 W., M. D. M., for irrigation purposes. Estimated cost \$1,000.

LAKE, NAPA, YOLO AND SOLANO COUNTIES—Application 6616. Karl Brehme of 1201 Hobart Bldg., San Francisco, for 200 c.f.s. and 100,000 acre-feet from Putah, Pope, Capel, Etiwara creeks tributary to Sacramento River to be diverted in Sec. 25, T. 8 N., R. 2 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,900,000.

CONTRA COSTA COUNTY—Application 6617. John Fleuti, Moraga, for 0.916 c.f.s. from (1) Grizzly Creek, (2) unnamed spring tributary to Walnut Creek to be diverted in Sec. 15, T. 1 S., R. 2 W., M. D. M., and Sec. 10, T. 1 S., R. 2 W., M. D. M., for domestic purposes. Estimated cost \$1,000.

SAN BERNARDINO COUNTY—Application 6618. Los Angeles Council of Camp Fire Girls, 1107 Security Bldg., Los Angeles, for 1/32 c.f.s. from Santa Ana River, to be diverted in Sec. 10, T. 1 N., R. 1 E., S. B. B. & M., for recreational purposes. Estimated cost \$1,000.

SISKIYOU COUNTY—Application 6619. John A. Foss, Hamburg, for 2 c.f.s. from Caroline Creek tributary to Klamath River to be diverted in Sec. 14, T. 46 N., R. 12 W., M. D. M., for irrigation purposes.

YUBA COUNTY—Application 6620. David N. Jones, c/o Steel and Lingenfelter, Marysville, for ½ c.f.s. from Dry Creek tributary to Bear River to be diverted in Sec. 34, T. 15 N., R. 6 E., M. D. B. & M., for irrigation and domestic purposes (50 acres). Estimated cost \$1,000.

EL DORADO COUNTY—Application 6621. Spicky Polish Corp., 1401 Third St., San Francisco, for 1 c.f.s. from White Rock Creek tributary to South Fork American River to be diverted in Sec. 32, T. 11 N., R. 11 E., M. D. M., for industrial purposes.

LOS ANGELES COUNTY—Application 6622. Cienega Springs Water Co., c/o R. B. Bidwell, Glendora, for .025 c.f.s. from tunnel to spring tributary to Big Dalton-San Gabriel Watershed to be diverted in Sec. 22, T. 1 N., R. 9 W., S. B. B. & M., for domestic purposes.

SAN JOAQUIN COUNTY—Application 6623. L. E. Grimsley, Est. Joseph Geiger, deceased, P. E. Holt & Anderson Orchard Co., a California corporation, c/o Neumiller & Ditz, 605 Bank of Italy Bldg., Stockton, for 2.56 c.f.s. from Calaveras River tributary to San Joaquin River, to be diverted in Sec. 4, T. 2 N., R. 9 E., M. D. M., for irrigation purposes (204.69 acres).

SAN JOAQUIN COUNTY—Application 6624. Raymond T. McGurk & C. H. McGurk, c/o Neumiller & Ditz, Bank of Italy Bldg., Stockton, for 2.91 c.f.s. from Calaveras River tributary to San Joaquin River to be diverted in Sec. 33, T. 3 N., R. 9 E., M. D. B. & M., for irrigation purposes (233 acres).

LOS ANGELES COUNTY—Application 6625. Geo. H. Lettean, 305 Security Bldg., Los Angeles, for

0.29 c.f.s. from 7 springs at head of Mint Canyon tributary to Santa Clara River Watershed to be diverted in Sec. 31, T. 6 N., R. 13 W., S. B. M., and Sec. 1, T. 5 N., R. 14 W., S. B. M., for irrigation and domestic purposes (230 acres).

EL DORADO COUNTY—Application 6626. United States, El Dorado National Forest of Placerville, for .0019 c.f.s. from Hemlock Creek, tributary to Upper Echo Lake to be diverted in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$250.

EL DORADO COUNTY—Application 6627. United States, El Dorado National Forest of Placerville, for .005 c.f.s. from Hemlock Creek tributary to Upper Echo Lake to be diverted in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$200.

TRINITY COUNTY—Application 6628. J. O. Gillice of Weaverville for (a) 50 c.f.s., (b) 100 c.f.s. from (a) Cedar Creek, (b) Horse Linto Creek tributary to Trinity River to be diverted in Sec. (a) 29, T. 7 N., R. 6 E., H. B. & M., and Sec. (b) S, T. 7 N., R. 6 E., H. B. & M., for mining purposes. Estimated cost \$150,000.

RIVERSIDE COUNTY—Application 6629. O. J. McMahan, c/o Frazier M. Sallee, San Jacinto, for .12 c.f.s. from unnamed stream to be diverted in Sec. 4, T. 7 S., R. 3 E., S. B. B. & M., for irrigation and domestic purposes (10 acres to be irrigated). Estimated cost \$2,000.

SAN JOAQUIN COUNTY—Application 6630. City of Stockton, Stockton, for 200 c.f.s. and 65,500 acre-feet per annum from Calaveras River tributary to San Joaquin River to be diverted in Sec. 31, T. 4 N., R. 11 E., M. D. B. & M., for power purposes (2550 h.p.).

SAN JOAQUIN COUNTY—Application 6631. City of Stockton, Stockton, for 50 c.f.s. and 90,000 acre-feet per annum from Calaveras River tributary to San Joaquin River to be diverted in Section 31, T. 4 N., R. 11 E., M. D. B. & M., for municipal purposes. Estimated cost \$1,500,000.

TULARE COUNTY—Application 6632. C. W. Gray of Hollywood, for .0012 c.f.s. from Mosquito Creek tributary to East Fork Kaweah River to be diverted in Sec. 16, T. 17 S., R. 31 E., M. D. M., for domestic purposes. Estimated cost \$350.

RIVERSIDE COUNTY—Application 6633. Wm. R. Peeler of 1701 S. Grand Ave., Los Angeles, for .0025 c.f.s. from spring tributary to Lake Elsinore to be diverted in Sec. 25, T. 6 S., R. 5 W., S. B. B. & M., for domestic purposes. Estimated cost \$500.

EL DORADO COUNTY—Application 6634. Wm. B. Parker of Placerville for 0.27 c.f.s. from Emigrant Ravine Creek tributary to Hangtown R. Webber Creek, South Fork American River to be diverted in Sec. 4, T. 10 N., R. 11 E., M. D. M., for irrigation purposes (22 acres). Estimated cost \$50.

SISKIYOU COUNTY—Application 6635. Buzzard Hill Mine, Inc., c/o L. J. Rowland, manager, Happy Camp, for 12.5 c.f.s. from Independence Creek tributary to Klamath River to be diverted in Sec. 32, T. 15 N., R. 7 E., H. M., for power and domestic purposes. Estimated cost \$10,000.

SISKIYOU COUNTY—Application 6636. Buzzard Hill Mine, Inc., c/o L. J. Rowland, manager, Happy Camp, for 0.05 c.f.s. from Independence Creek tributary to Klamath River to be diverted in Sec. 32, T. 15 N., R. 7 E., H. M., for irrigation and domestic purposes. Estimated cost \$2,000.

SISKIYOU COUNTY—Application 6637. Buzzard

Hill Mine, Inc., c/o L. J. Rowland, manager, Happy Camp, for 0.25 c.f.s. from Independence Creek tributary to Klamath River to be diverted in Sec. 32, T. 15 N., R. 7 E., H. M., for mining purposes. Estimated cost \$10,000.

MODOC COUNTY—Application 6638. John Miller, Lake City for 1.65 c.f.s. from Mill Creek tributary to Upper Lake to be diverted in Sec. 36, T. 44 N., R. 15 E., M. D. B. & M., for irrigation and domestic purposes (115.2 acres).

MODOC COUNTY—Application 6639. W. J. Hays, Mrs. Nannie Daniels, G. M. Warrens and Mrs. C. H. Darst, Lake City, for 3 c.f.s. from Mill Creek tributary to Upper Lake to be diverted in Sec. 36, T. 44 N., R. 15 E., M. D. B. & M., for irrigation and domestic purposes (252 acres).

MODOC COUNTY—Application 6640. Simon Bennett, Cedarville, for 1.35 c.f.s. from Mill Creek tributary to Upper Lake to be diverted in Sec. 36, T. 44 N., R. 15 E., M. D. B. & M., for irrigation and domestic purposes (160 acres).

MODOC COUNTY—Application 6641. Grove Wimer, Lake City, for 1 c.f.s. from Mill Creek tributary to Dry Alkali Lakes, to be diverted in Sec. 35, T. 44 N., R. 15 E., M. D. M., for irrigation purposes (15 acres). Estimated cost \$100.

MENDOCINO COUNTY—Application 6642. Murphy & Yarbrough, c/o H. S. Stocker, Ukiah, for 1 c.f.s. from Forsyth Creek tributary to Russian River, to be diverted in Sec. 16, T. 16 N., R. 12 W., M. D. M., for irrigation and domestic purposes (121.2 acres). Estimated cost \$800.

BUTTE COUNTY—Application 6643. H. D. March, Chico, for .5 c.f.s. from spring tributary to Little Butte Creek to be diverted in Sec. 30, T. 22 N., R. 3 E., M. D. M., for power purposes. Estimated cost \$2,000.

BUTTE COUNTY—Application 6644. H. D. March, Chico, for .5 c.f.s. from spring tributary to Little Butte Creek to be diverted in Sec. 30, T. 22 N., R. 3 E., M. D. M., for irrigation and domestic purposes (70 acres). Estimated cost \$2,000.

LAKE COUNTY—Application 6645. Martin Judge, Jr., and Co., Crocker First National Bank Bldg., San Francisco, for 250 c.f.s. and 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

LAKE COUNTY—Application 6646. Martin Judge, Jr., and Co., Crocker First National Bank, Bldg., San Francisco, for 175,000 acre-feet per annum from North Fork of Cache Creek, tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation purposes (50,000 acres). Estimated cost \$1,000,000.

SISKIYOU COUNTY—Application 6647. Buzzard Hill Mine, Inc., c/o L. J. Rowland, manager, Happy Camp, for 2.75 c.f.s. from Buzzard Creek tributary to Klamath River to be diverted in Sec. 4, T. 15 N., R. 7 E., H. B. & M., for power purpose (68.7 h.p.). Estimated cost \$2,000.

SISKIYOU COUNTY—Application 6648. Buzzard Hill Mine, Inc., c/o L. J. Rowland, manager, Happy Camp, for .25 c.f.s. from Buzzard Creek tributary to Klamath River to be diverted in Sec. 4, T. 15 N., R. 7 E., H. B. & M., for mining and domestic purposes. Estimated cost \$2,000.

SAN DIEGO COUNTY—Application 6649. Southern California Water Supply Co., c/o F. M. Faude, vice president, Loveland Engineers, Inc., 1010 Bank

of Italy Bldg., San Francisco, for 18.6 c.f.s. and 40,000 acre-feet per annum from Sweetwater River tributary to San Diego Bay to be diverted in Sec. 17, T. 16 S., R. 2 E., S. B. B. & M., Storage in T. 17 S., R. 2 E., S. B. B. & M., for irrigation and domestic purposes (5000 acres). Estimated cost \$1,500,000.

EL DORADO COUNTY—Application 6650. Florence D. Smith, 219 Kentucky St., Petaluma, for .001 c.f.s. from Winfield Spring tributary to Fallen Leaf Lake to be diverted in Sec. 13, T. 12 N., R. 17 E., M. D. B. & M., for domestic purposes. Estimated cost \$125.

VENTURA COUNTY—Application 6651. Chester F. Robbins, 468 E. Main St., Ventura, for 1.00 c.f.s. from Middle Fork of Lockwood Creek tributary to Lockwood Creek, Piru Creek, to be diverted in Sec. 20, T. 8 N., R. 21 W., S. B. B. & M., for irrigation and domestic purposes (80 acres). Estimated cost \$2,000.

PLACER COUNTY—Application 6652. Bear River Water and Power Co., c/o J. L. Rollins, manager, Colfax, 211,020 acre-feet per annum from Bear River tributary to Feather River to be diverted in Sec. 22, T. 15 N., R. 9 E., M. D. B. & M., for power purposes (4250 h.p.). Estimated cost \$2,500,000.

SANTA CLARA COUNTY—Application 6653. Mrs. A. F. Cochrane, c/o Louis O'Neal, First National Bank Bldg., San Jose, for 0.25 c.f.s. from Coyote River tributary to San Francisco Bay to be diverted in Sec. 11, T. 9 S., R. 3 E., M. D. M., for irrigation purposes (51 acres).

SANTA CLARA COUNTY—Application 6654. Mrs. A. F. Cochrane, c/o Louis O'Neal, First National Bank Bldg., San Jose, for 0.22 c.f.s. from Coyote River tributary to San Francisco Bay to be diverted in Sec. 11, T. 9 S., R. 3 E., M. D. M., for domestic purposes. Estimated cost \$250.

SANTA CLARA COUNTY—Application 6655. Mrs. A. F. Cochrane, c/o Louis O'Neal, First National Bank Bldg., San Jose, for 0.22 c.f.s. from Coyote River tributary to San Francisco Bay to be diverted in Sec. 13, T. 9 S., R. 3 E., M. D. M., for irrigation purposes (18 acres). Estimated cost \$1,500.

SANTA CLARA COUNTY—Application 6656. Mrs. A. F. Cochrane, c/o Louis O'Neal, First National Bank Bldg., San Jose, for 0.12 c.f.s. from Coyote River tributary to San Francisco Bay to be diverted in Sec. 11, T. 9 S., R. 3 E., M. D. M., for irrigation purposes (9½ acres).

SAN LOUIS OBISPO COUNTY—Application 6657. Dr. O. M. Polin, c/o J. D. McGregor, Gibson-Drexler Bldg., San Luis Obispo, for 1.78 c.f.s. from well tributary to San Luis Obispo Creek, to be diverted in Sec. 10, T. 31 S., R. 12 E., M. D. M., for irrigation purposes (131 acres). Estimated cost \$20,000.

LOS ANGELES COUNTY—Application 6658. William H. Cruzan, Rt. 1, Box 110, Saugus, for .5 c.f.s. from 3 springs, tributary to Mint Canyon, Santa Clara River, to be diverted in Sec. 4, T. 5 N., R. 14 W., S. B. B. & M., for mining purposes. Estimated cost \$26,000.

EL DORADO COUNTY—Application 6659. U. S. El Dorado National Forest, c/o Edwin F. Smith, supervisor, Placerville, for .0027, or approximately 1800 gals. per day, from unnamed stream tributary to Upper Echo Lake to be diverted in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$150.

BUTTE COUNTY—Application 6660. A. H. Dakin, Magalia, for 40 c.f.s. from Empire Creek tribu-

tary to West Branch of North Fork of Feather River to be diverted in Sec. 20, T. 23 N., R. 4 E., M. D. B. & M., for mining purposes. Estimated cost \$300.

RIVERSIDE COUNTY—Application 6661. J. O. Blackburn, Hemet, for 3000 gallons per day from Bee Canyon Spring tributary to San Jacinto River to be diverted in Sec. 12, T. 5 S., R. 1 E., S. B. B. & M., for irrigation purposes. Estimated cost \$3,000.

RIVERSIDE COUNTY—Application 6662. Lucile Mann Morris, Keen Camp, for 8 miner's inches, or .2 c.f.s., from spring tributary to San Jacinto River to be diverted in Sec. 8, T. 6 S., R. 4 E., S. B. B. and M., for irrigation purposes (20 acres). Estimated cost \$1,100.

SAN BERNARDINO COUNTY—Application 6663. Otto E. Kanka, Lucerne Valley, for 20 miner's inches, or .5 c.f.s., from unnamed spring tributary to Mojave Desert to be diverted in Sec. 10, T. 3 N., R. 1 W., S. B. B. & M., for irrigation and domestic purposes. Estimated cost \$3,000.

SUTTER COUNTY—Application 6664. James R. Young, Cranemore, for 1.94 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 14, T. 13 N., R. 1 E., M. D. B. & M., for irrigation purposes (154.97 acres). Estimated cost \$5,000.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during April, 1930.

ORANGE COUNTY—Permit 3458, Application 5304. Issued to San Juan Water Co., Los Angeles, April 2, 1930, for 2000 acre-feet per annum from San Juan Creek in Sec. 23, T. 8 S., R. 5 W., S. B. M., for domestic purposes.

MENDOCINO COUNTY—Permit 3459, Application 6544. Issued to Robert B. Finn, Mill Valley, April 5, 1930, for .025 c.f.s. from unnamed creek tributary to South Eel River in Sec. 21, T. 19 N., R. 12 W., M. D. M., for domestic purposes. Estimated cost \$450.

MARIPOSA COUNTY—Permit 3460, Application 6041. Issued to William Winsell, Nipinnawasee, April 15, 1930, for 500 gal. per day from Chowchilla Creek in Sec. 18, T. 5 S., R. 21 E., M. D. M., for domestic purposes. Estimated cost \$1,200.

MARIPOSA COUNTY—Permit 3461, Application 6139. Issued to Chris W. and Ebba W. Jeppeson, Romona, April 15, 1930, for .0031 c.f.s. from Chowchilla Creek in Sec. 18, T. 5 S., R. 21 E., M. D. M., for domestic purposes. Estimated cost \$1,200.

SIERRA COUNTY—Permit 3462, Application 6563. Issued to United States Tahoe National Forest, Nevada City, April 17, 1930, for 0.04 cubic foot per second from unnamed spring in Sec. 1, T. 20 N., R. 12 E., M. D. M., for domestic and recreational purposes. Estimated cost \$100.

LASSEN COUNTY—Permit 3463, Application 6324. Issued to Lester F. Totten, Bieber, April 21, 1930, for 2 acre-feet per annum from unnamed stream in Sec. 16, T. 36 N., R. 11 E., M. D. M., for stock watering. Estimated cost \$350.

INYO COUNTY—Permit 3464, Application 6532. Issued to H. M. White, Independence, April 28, 1930, for 0.002 c.f.s. from small unnamed spring in Sec. 10, T. 13 S., R. 34 E., M. D. M., for mining and domestic purposes. Estimated cost \$50.

YUBA COUNTY—Permit 3465, Application 6543. Issued to Wallace James Stanford, Wheatland, April 28, 1930, for 0.67 c.f.s. from Dry Creek in Sec. 34, T. 15 N., R. 6 E., M. D. M., for irrigation and domestic purposes on 100 acres. Estimated cost \$3,500.

LOS ANGELES COUNTY—Permit 3466, Application 6548. Issued to Isaac Wiskerson, Palmdale, April 28, 1930, for .025 c.f.s. from Granite Springs in Sec. 24, T. 6 N., R. 14 W., S. B. M., for irrigation and domestic purposes on 2 acres. Estimated cost \$400.

SIERRA COUNTY—Permit 3467, Application 6433. Issued to J. B. Harris, Downieville, April 29, 1930, for 0.125 c.f.s. from two unnamed springs in Sec. 32, T. 20 N., R. 10 E., M. D. M., for power purposes. Estimated cost \$500.

GLENN COUNTY—Permit 3468, Application 6562. Issued to William F. Linton, Orland, April 30, 1930, for 0.81 c.f.s. from unnamed stream in Sec. 8, T. 21 N., R. 3 W., M. D. M., for irrigation and domestic purposes on 5 acres. Estimated cost \$400.

TRINITY COUNTY—Permit 3469, Application 6149. Issued to C. M. Salyer, Salyer, April 30, 1930, for 80 c.f.s. from Cedar Flat Creek in Sec. 24, T. 6 N., R. 5 E., H. M., for mining purposes.

DAM APPLICATIONS, APPROVALS AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of April, 1930.

AMADOR COUNTY—Original Amador Dam No. 472. J. W. Bullock, Amador City, owner; ambursen, 28 feet above streambed. Situated on Amador Creek tributary to Mokelumne River in Sec. 34, T. 7 N., R. 10 E., M. D. M., for storage purposes for debris use. Estimated cost \$17,500.

AMADOR COUNTY—Ludekins Dam No. 475. Ludekins Brothers, Pine Grove, owner; earthfill, 18 feet above streambed with a storage capacity of 8 acre-feet. Situated on Grass Valley tributary to Main Creek in Sec. 34, T. 7 N., R. 12 E., M. D. M., for storage purposes for debris use. Estimated cost \$2,000.

CALAVERAS COUNTY—San Mateo Produce Dam No. 495. California Lands, Inc., San Francisco, owner; arch and rock fill, 8 feet above streambed with a storage capacity of 60 acre-feet. Situated on an unnamed creek tributary to Calaveras River in Sec. 4, T. 3 N., R. 10 E., M. D. M. Estimated cost \$20,000.

CALAVERAS COUNTY—Salt Springs Valley No. 496. The California Company, Inc., Stockton, owner; earthfill, 53 feet above streambed with a storage capacity of 19,170 acre-feet. Situated on Rock Creek tributary to Littlejohn Creek in Sec. 16, T. 2 N., R. 11 E., M. D. M., for storage and diversion purposes for mining and irrigation use. Estimated cost \$100,000.

EL DORADO COUNTY—Ruple Dam No. 463. A. J. Ruple, Placerville, owner; earthfill, 12 feet above streambed with a storage capacity of 2 acre-feet. Situated on Webber Creek tributary to American River in Sec. 11, T. 11 N., R. 10 E., M. D. M., for storage purposes for irrigation use.

HUMBOLDT COUNTY—North Fork Dam No. 201. California Barrel Company, Arcata, owner; wood, 22 feet above streambed with a storage capacity of 20 acre-feet. Situated on Long Prairie Creek tributary to North Fork Mad River in Sec. 12, T. 6 N., R.

2 E., H. B. & M., for storage purposes for logging use. Estimated cost \$10,000.

LASSEN COUNTY—Hog Flat Dam No. 236. Lassen Irrigation Company, Standish, owner; rock and earthfill, 18 feet above streambed with a storage capacity of 8000 acre-feet. Situated on Hog Flat tributary to Susan River located in Sec. 20, T. 30 N., R. 10 E., for storage purposes for irrigation use. Estimated cost \$10,000.

LASSEN COUNTY—Lake Leavitt Dam No. 236-2. Lassen Irrigation Company, Standish, owner; earthfill with a storage capacity of 14,000 acre-feet situated on Alkali Lake Basin tributary to Susan River in Sec. 15, T. 29 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$30,000.

LASSEN COUNTY—McCoy Flat No. 236-3. Lassen Irrigation District, Standish, owner; rock and earthfill, 14 feet above streambed with a storage capacity of 18,000 acre-feet, situated on Susan River in Sec. 23, T. 30 N., R. 9 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$17,500.

LOS ANGELES COUNTY—Shea Dam No. 777. R. P. Shea, Los Angeles, owner; arch 15 feet above streambed with a storage capacity of 15 acre-feet. Situated on an unnamed creek tributary to Antelope Valley Creek in Sec. 17, T. 7 N., R. 14 W., S. B. M., for storage purposes for recreation use. Estimated cost \$12,000.

LOS ANGELES COUNTY—Kewen No. 5 Reservoir Dam No. 2. City of Alhambra, Alhambra, owner; earthfill, 22 feet above streambed with a storage capacity of 15 acre-feet. Situated on Mill Creek tributary to San Gabriel River in Sec. 33, T. 1 N., R. 12 W., S. B. M., for storage purposes for municipal and other uses. Estimated cost \$67,627.

MOHOC COUNTY—Webb Flat Dam No. 160. Peter Gerig, Bieber, owner; earthfill, 5 feet above streambed with a storage capacity of 100 acre-feet, situated on an unnamed drainage tributary to Egg Lake in Sec. 7, T. 41 N., R. 7 E., M. D. M., for storage purposes for stock water use.

MODOC COUNTY—McGinty Dam No. 131. X. L. Land and Cattle Company, Alturas, owner; earthfill, 16 feet above streambed with a storage capacity of 340 acre feet. Situated on an unnamed drainage tributary to Goose Lake in Sec. 30, T. 46 N., R. 13 E., M. D. M., for storage purposes for irrigation and domestic use.

MONTEREY COUNTY—San Carlos Dam No. 644. Rancho San Carlos, Inc., Monterey, owner; rockfill, 15 feet above streambed with a storage capacity of 150 acre-feet. Situated on Yarnas Creek tributary to Carmel River in Sec. 18, T. 17 S., R. 2 E., M. D. M., for storage purposes for recreation use. Estimated cost \$13,500.

NAPA COUNTY—Gordon Valley Dam No. 14. City of Vallejo, Vallejo, owner; earthfill, 92 feet above streambed with a storage capacity of 10,000 acre-feet. Situated on Gordon Valley Creek tributary to Suisun Creek in Sec. 19, T. 6 N., R. 2 W., M. D. M., for storage purposes for municipal use. Estimated cost \$300,000.

NAPA COUNTY—Distributing Reservoir Dam No. 7-2. City of Napa, Napa, owner; gravity, 35 feet above streambed with a storage capacity of 28 acre-feet. Located in Lot 21, Imrieville, for distribution purposes for municipal use.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown-Willamette Paper Company, San Francisco, owner; crib, 18 feet above streambed with a storage capacity of 11.15 acre-feet. Situated on Truckee River

in Sec. 30, T. 18 N., R. 18 E., M. D. M., for diversion purposes for power use.

NEVADA COUNTY—Swamp Angel Dam No. 306. Swamp Angel Mining Company, Arroyo Grande, owner; arch, 20 feet above streambed. Situated on Steep Hollow tributary to Bear River in Sec. 12, T. 16 N., R. 10 E., M. D. M., for storage purposes for debris use. Estimated cost \$4,500.

NEVADA COUNTY—Boulder Brook Dam No. 310. D. L. Jungck, Berkeley, owner; arch, 5 feet above streambed with a storage capacity of 30 acre-feet. Situated on Boulder Brook tributary to Bear River in Sec. 32, T. 14 N., R. 8 E., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$5,000.

RIVERSIDE COUNTY—Lake Norconian West Dam No. 820-A. Rex B. Clark, Norco, owner; earthfill, 9 feet above streambed with a storage capacity of 500 acre-feet. Situated on no stream in Sec. 12, T. 3 S., R. 7 W., S. B. M., for storage purposes for recreation use.

RIVERSIDE COUNTY—Lake Norconian South Dam No. 820-B. Rex B. Clark, Norco, owner; earthfill, 13 feet above streambed with a storage capacity of 500 acre-feet. Situated on no stream in Sec. 12, T. 3 S., R. 7 W., S. B. M., for storage purposes for recreation use.

SACRAMENTO COUNTY—Daily Dam No. 452. Geo. O. Kyburz, Folsom, owner; earthfill, 13 feet above streambed. Situated on an unnamed draw tributary to Alder Creek, for storage purposes for stock watering use.

SAN BERNARDINO COUNTY—Los Serranos Dam No. 808. Davidson Investment Company, Long Beach, owner; earthfill, 12 ft. above streambed with a storage capacity of 110 acre-feet. Situated on no stream in Sec. 22, T. 2 S., R. 8 W., S. B. M., for storage purposes for irrigation use.

SAN DIEGO COUNTY—Green Dam No. 835. West Missouri Power Company, Escondido, owner; earthfill, 19 feet in height with a storage capacity of 8.4 acre-feet. Situated on no stream, for storage purposes for irrigation use. Estimated cost \$2,000.

SAN DIEGO COUNTY—Lemon Grove, Larger Dam No. 56-T. La Mesa, Lemon Grove and Spring Valley Irrigation District, La Mesa, owner; earthfill, 30 feet above streambed with a storage capacity of 15 acre-feet. Located in Sec. 25, T. 16 S., R. 2 W., S. B. M., for storage purposes for irrigation use.

SAN DIEGO COUNTY—Lemon Grove, Smaller Dam No. 56-S. La Mesa, Lemon Grove and Spring Valley Irrigation District, La Mesa, owner; earthfill, 30 feet above streambed with a storage capacity of 15 acre-feet. Located in Sec. 30, T. 16 S., R. 1 W., S. B. M., for regulating purposes for irrigation use.

SAN MATEO COUNTY—Crocker Dam No. 616. Provident Securities Company, Hillsborough, owner; earthfill, 35 feet above streambed with a storage capacity of 34 acre-feet. Situated on South Branch of Sanchez Creek tributary to San Francisco Bay. Located in San Mateo Rancho, for storage purposes for irrigation use.

SAN MATEO COUNTY—Notre Dame Dam No. 619. College of Notre Dame, Belmont, owner; earthfill, 40 feet above streambed. Situated on Belmont Creek for storage purposes for irrigation use.

SANTA CLARA COUNTY—Losse Dam No. 623. Vivian Losse Blair et al., Sunnyvale, owners; concrete. Situated on Stevens Creek tributary to San Francisco Bay in Sec. 3, T. 7 S., R. 2 W., M. D. M., for diversion purposes for irrigation use.

SANTA CRUZ COUNTY—Gilroy Dam No. 15. City of Gilroy, owner; concrete, 8 feet above streambed. Situated on Uvas Creek tributary to Pajaro River, for diversion purposes for municipal and domestic use. Estimated cost \$2,000.

SHASTA COUNTY—Burney Creek Dam No. 221. Mrs. Edna H. Black, San Francisco, owner; earthfill 11 feet above streambed with a storage capacity of 670 acre-feet. Situated on Burney Creek tributary to Pit River in Sec. 32, T. 36 N., R. 3 E., M. D. M., for storage purposes for irrigation and reclamation use. Estimated cost \$10,000.

YUBA COUNTY—Horse Valley Dam No. 332. Turner & Rabe, Comptonville, owner; arch, 25 feet above streambed. Situated on Horse Valley Creek tributary to Willow Creek, in Sec. 35, T. 19 N., R. 25 E., M. D. M., for storage purposes for debris use.

Application for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of April, 1930.

LOS ANGELES COUNTY—Mulholland Dam No. 6-17. City of Los Angeles, Los Angeles, owner; gravity arch, 191 feet above streambed with a storage capacity of 7437 acre-feet situated on Weid Canyon in Sec. 3, T. 1 S., R. 14 W., S. B. M., for storage purposes for municipal use.

SAN DIEGO COUNTY—Lake Loveland Dam No. 840-3. Southern California Water Supply Company, San Francisco, owner; arch, 183 feet above streambed with a storage capacity of 27,700 acre feet. Situated on Sweetwater River in Sec. 17, T. 16 S., R. 2 E., S. B. M., for storage and diversion purposes for municipal and other uses. Estimated cost \$490,258. Fees paid \$2,951.29.

SUTTER COUNTY—Allen Dam No. 1-12. Preston School of Industry, Waterman, owner; buttress, 21 feet above streambed with a storage capacity of 2½ acre-feet, situated on Downes or Ione Ditch in Sec. 27, T. 6 N., R. 10 E., M. D. M., for storage purposes for domestic use. Estimated cost \$10,120.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of April, 1930.

BUTTE COUNTY—Lake Madrone Dam No. 342-2. Geo. C. Mansfield and Duncan C. McCallum, Oroville, owner; ambursen, 27 feet above streambed. Situated on Berry Creek tributary to Feather River in Sec. 27, T. 21 N., R. 5 E., M. D. M., for storage purposes for recreation use. Estimated cost \$20,000.

EL DORADO COUNTY—Rock Creek Dam No. 465. Arthur E. Rasor, Georgetown, owner; earthfill, 30 feet above streambed with a storage capacity of 34.2 acre-feet. Situated on Rock Creek tributary to South Fork American River in Sec. 34, T. 13 N., R. 11 E., M. D. M., for storage and diversion purposes for domestic, irrigation, mining and recreation use. Estimated cost \$2,000.

Colored Parson—"Now kin enny ob yo' sinuers tell me why the lion didn't eat Dan'?"

Nobody answered.

"Wal, ah'll tell yer bunch of unbelievers," he yelled; 'twas cos most o' him was backbone, an' the rest was grit."

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



In this Issue:
The California Highway
Patrol Goes to School

Official Journal of the Department of Public Works
State of California

JUNE

1930

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Traffic Officers Go to School

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CALIFORNIA'S highway patrolmen are learning to do their jobs better by going to school.

Operated under a new section of the Motor Vehicle Act requiring its establishment, the first of a series of training schools for the officers was opened at the State Fair grounds in Sacramento on May 27th.

Approximately forty inspectors and captains from all parts of the state were chosen for the initial period of three weeks. A second group of fifty was drawn immediately after the officers attending the first school had returned to their regular duties.

The school is being operated along semi-military lines with reveille at 6.30 a.m. and taps at 10.30 p.m. Each day starts with thirty minutes of snappy physical exercise followed by close order drill. Classes start immediately after breakfast, continuing throughout the day and well into the evening.

Rigorous and intensive as this course of study and living seems it is enjoyed by the officers, who realize if they expect to make their living in the exercise of the duties of the traffic officer they must learn what those duties are and how best to perform them.

By a fortunate arrangement made possible



The traffic officers in school

Both schools were preliminary in character and will be a sort of prelude to the regular schools to be established for a three months' period to train patrolmen. Quarters of the United States Air Corps at Mather Field, near Sacramento, will be used for the final school periods, permission to use them having been obtained from the War Department by General James J. Borree, head of the Bureau of Schools and Education of the California Highway Patrol, who is in complete charge of the schools.

through the cooperation of the Department of Finance, the patrol was able to obtain the use of the grandstand building, which is equipped with a complete kitchen and dining room and has ideal facilities for sleeping quarters.

The men were thus able to get their meals in the same building in which classes were held, the entire upper floor of the building being taken over by the school.

Although the students were called on at times to do minor fatigue duty, all details of preparing and planning meals were left up to

(Continued on page 40.)

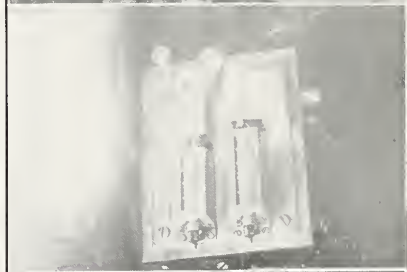
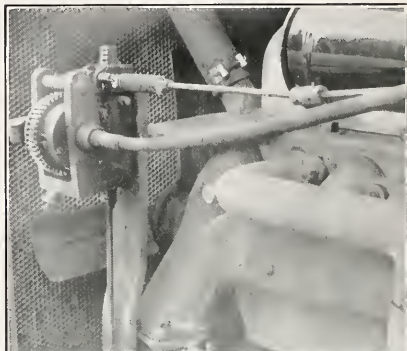
Making Our Highways Smooth

By R. M. GILLIS, Assistant Construction Engineer

BECAUSE the public demands above all things that a pavement shall be smooth riding, all of our highway departments are bending every effort in the construction of their roads to secure a surface that will give the fewest possible bumps to the motorist who passes over them. Engineers, contractors and equipment manufacturers are all working to perfect methods and machinery that will make the way of the passing autoist easier.

To have some unit of measure by which the roughness of a road could be accurately gauged, the California highway engineers have tried numerous devices to measure and record the size and number of bumps per mile of surface. In one instance a somewhat elaborate attachment on a car attempted to draw a profile of the road as recorded by the action of the car springs, in another a sled was drawn behind a car and electrical connections rang a bell when high or low spots in the surface were encountered. All of these methods were either inaccurate, cumbersome, or interfered with traffic when operated, and were not entirely satisfactory. In 1926 the Bureau of Public Roads designed an instrument for this purpose which could be attached to any car without marring it, was satisfactorily accurate and was simple in construction. This has been used by California for the past three years.

Briefly described, the "roughometer," as it is called, measures the spring travel of the car as it is driven over the road. A rack fastened by a rod to the front axle of the car engages a pinion fastened to the frame; through a ratchet the pinion drives a speedometer cable which turns a counter on the dashboard. The numbers registered by this counter are taken as units of roughness. A



The accompanying picture shows the machinery by which smoothness of California highways is tested. The top picture shows a roughometer attached under the hood of a car. The middle picture shows the counters attached to the dash. The upper dial registers units of roughness and the lower dial shows miles to the nearest hundredth. The lower picture shows the car running over the calibration board.

second counter on the dash is connected with the speedometer drive and registers miles to the nearest hundredth. A lever on the dash

(Continued on page 30.)

The Barstow Overhead Crossing

By A. H. STOVER, Designing Engineer of Bridges

FOR the past several years the problem of elimination of highway crossings at grade with main line railroads has been one of steadily increasing importance in the construction of safe, high-speed, first-class highways. Hundreds of thousands of dollars have been

spent in California by the cities, counties, State Division of Highways, and the railroad companies for the construction of under-grade and overhead structures in order to eliminate grade crossings both on old and new highway construction. A great many of these eliminations have been effected by depressing the



A. H. STOVER

grade of the highway for a few hundred feet and supporting the tracks with steel girders resting on concrete abutments; and others, where the railroad may be crossed in a cut, by a few simple concrete spans. However, some of the crossing elimination projects involve major structures, costing two to three hundred thousand dollars. A notable example of the latter class is the overhead crossing and approach fills recently completed over the

tracks of the Atchison, Topeka and Santa Fe Railway in the town of Barstow, San Bernardino County. The importance of this project is due both to the geographical location with respect to the state and national highway system, and to the size and cost of the structure.

The location is at the intersection of state highway routes 31 and 58. Route 31 is one of the primary roads and extends from San Bernardino to the Nevada line near Jean. It is also a link in the Arrowhead Trail, a continental route extending through Wyoming, Utah and Nevada, on the way to the coast. Route 58 is also a part of the state primary system of roads and extends from Mojave by way of Barstow and Needles to the Arizona line at Topock. This route is a section of the transcontinental highway known as the National Old Trails, which carries a large volume of tourist traffic to and from California by way of Arizona, New Mexico and Colorado. With the large amount of out-of-state traffic and the local and commercial traffic on the highway, and a considerable amount of through and yard movement on the railroad, a safe and convenient crossing is of utmost importance for both parties, as well as the local citizens.

The structure itself is of sufficient size to warrant attention. It consists of three 172-foot by 6-inch steel truss spans, two 65-foot deck plate girder spans, one 76-foot deck plate girder span, one 40-foot steel span and approximately 392 feet of timber trestle. The



The New Barstow Overhead Crossing

total length of the bridge is 1193 feet, which, with about 800 feet of fill, involving 24,000 cubic yards of embankment, makes an overall length for the project of nearly 2000 feet.

The three truss spans and the deck plate girder spans are supported on concrete piers with spread footings. The timber spans and the steel beam span are on frame bents with concrete pedestals. All excavation for the footings were made by hand and, due to the fact that the material was very loose and dry and to the proximity of heavy rail traffic, substantial timbering was necessary in all of the pits. Practically all of the excavations were in made ground consisting of sand, rock and cinders; but satisfactory foundation material was encountered in the old stream bed which underlays the railroad fill at this point.

The center steel truss span was erected by cantilevering out from the adjacent spans, as the placing of false-work would have been practically impossible due to the great number of trains passing.

Customary methods of mixing and placing concrete were followed in the construction of the footings and piers, with the exception that certain adjustments were necessary to handle the work without interfering with train and yard operations of the railroad company. An especially smooth finish was obtained on the piers by the use of first-class form material and good workmanship, both in the construction of the forms and in placing the concrete. About 700 cubic yards of concrete were used in this part of the structure.

The 616 tons of structural steel required for the truss and plate girder spans was furnished by the Virginia Bridge and Iron Works, Roanoke, Virginia. The steel arrived at the bridge site on flat cars and was lifted into place by a locomotive crane. Experienced steel workers and riveters were employed and very satisfactory workmanship was obtained.

Since practically all of the steel spans of the structure are over the railroad tracks and yards and will be subjected to the steam and smoke of the locomotives, a black bituminous enamel paint was substituted for the gray aluminum paint ordinarily used on highway bridges in the state. As this paint has not been used extensively, the contractors were not familiar with the best methods of handling it, and had some difficulty at the beginning, but, after securing the services of a representative of the paint company, a very satisfactory job resulted.

The three long steel truss spans and the

plate girder spans were necessary to cross the numerous tracks of the Atchison, Topeka and Santa Fe division yards. Twenty-four tracks are now in use under the bridge and provision is made for several additional tracks which may be required at a future date. The 40-foot steel beam span crosses over a city street which accommodates local traffic paralleling the railroad yards. Two stairways from the level of the yards to the bridge deck and a sidewalk from the south end of the bridge to the north end of the plate girder spans are provided for the convenience of the railroad employees and other pedestrian traffic crossing the tracks. The sidewalk is five feet wide, the roadway on the bridge twenty-four feet, and the approach fills are graded to a width of thirty feet.

Bids for this contract were received June 13, 1929. The contract was awarded to the Lynch-Cannon Engineering Co. of Los Angeles. The contract was approved by the attorney for the state on July 16, 1929, but, due to the extreme hot weather and consequent difficult working conditions during the summer months on the Mojave Desert, no work on the bridge was done until October 10th.

Despite the delay in starting, the contractors completed all items of the contract April 28, 1930, nearly three months ahead of the scheduled date for completion.

First-class workmanship characterized the job throughout, and the resulting finished structure is highly satisfactory to the state, the railroad, and the local citizens.

The total cost of the contract was \$158,142.77.

Traffic Officer (reproachfully): "Young lady, do you know anything about the traffic laws of this city?"

Fair Motorist: "Yes, a little. Can I help you?"

Pat Murphy attended a safety meeting. The boys had been given some printed instruction and the safety man wanted to check on results.

"Pat," he said, "Can you give me six good reasons for safety?"

Now Pat wasn't up on his reading but he was rather quick with his comeback.

"Sure," he replied, "The four little Murphys, me wife and myself."—*Mo. Pac. Magazine*.

That he has outroughed "Wild West Bill," the bad man who rode into town on a mountain lion with a rattlesnake for a whip, is the claim of Joe Davis, telephone company employee of Winnemucca. Davis catches wildcats in his overalls.

While en route to Battle Mountain in an automobile he saw a young wildcat cross the highway and dart into a small culvert. He stopped his machine and determined to make a catch.

Removing his overalls, Davis tied the legs and placed the waist end over the culvert. Then he chased the wildcat into the trap. He has it at his home in Winnemucca to support his story.

State Supervision of Dams

By GEO. W. HAWLEY, Deputy in Charge of Dams*

THE continued economic growth and prosperity of California, in common with that of any semiarid region having variable stream flow, is in large part dependent on complete economic utilization of its water resources and the degree of flood protection afforded. The natural stream flow of California will admit of very limited increase over present use and consequently the future water supply will be obtained chiefly by storage.

It is, therefore, axiomatic that dam building will increase rather than diminish both in size and number of dams, and since the most favorable sites, topographically, geologically and economically, are first in order to be developed it follows that as requirements for storage and flood control increase the suitability of the available sites will be less favorable. As a complement of this proposition, the property values and number of lives which might be jeopardized through the failure of any dam or affected by the construction of a dam, are becoming increasingly great. Because of the urgent necessity for constructing additional dams, their increasing magnitude, and diversification of type, it is imperative to safeguard, in so far as is humanly possible, public safety and security against the potential hazards of impounded water. This can be effected only through proper and adequate engineering supervision over the design, construction, maintenance and operation of all dams.

Prior to the enactment of legislation governing the supervision of dams in California there existed in this state, as in many other states, several regulatory agencies with varying degrees of authority and responsibility, exercising jurisdiction in differing degrees from complete control over some dams to partial, ineffective, divided, or no supervision over others. Lack of centralized authority and responsibility can result only in confusion of authority, divided responsibilities, ineffective supervision and a state of insecurity in the minds of interested parties.

Inherent public fear attaches to dams more, perhaps, than to any other engineering work because, no doubt, of the appalling loss of life and property which has been caused by the



GEORGE W. HAWLEY

failure of dams and which it has been felt was in a high degree preventable. Public fear was accentuated by failure of the St. Francis Dam, together with questions as to the integrity and safety of other dams. Safeguarding the life and property of its people is a sovereign duty of the state and authorization to supervise the construction and maintenance of dams has been held to be not only a proper but necessary exercise of the police powers of the state. (Decision of Appellate Court in *Bent Bros. vs. Campbell*, published in November, 1930, issue, CALIFORNIA HIGHWAYS AND PUBLIC WORKS.)

The last legislature, cognizant of the imperative need of safeguarding life and property and in accordance with the police power of the state, enacted chapter 766, Statutes of 1929, governing the supervision of all dams in California other than those federally owned. This act, perhaps the most complete and far-reaching legislation enacted for a similar purpose by any governmental agency, embodies the salient features of many drafts proposed,

* (Resume of discussion before annual convention of A. S. C. E. Credit to be given transactions A. S. C. E.)

during the formulative stages, by individuals, engineering groups, municipalities, irrigation districts, power companies and outstanding legal authorities. The act, by reason of the thorough analysis of its many phases, conscientious effort directed to its preparation, and the extent gone to in reconciling major differences of opinion, has in general met with the accord of all interested parties as evidenced by the hearty cooperation and invaluable assistance rendered by such interests in their endeavor to make the law effective.

The law places under the jurisdiction of the State Engineer all dams in California, heretofore built or hereafter to be built, other than federal dams, which have a capacity of 10 acre-feet or more or a height of 15 feet or more, regardless of ownership or other supervisory control. The State Engineer is authorized to cooperate with agencies having joint jurisdiction, such as the California Debris Commission, Federal Power Commission and U. S. Forest Service, and is invested with authority and directed to supervise the construction, enlargement, alteration, repair, maintenance, operation and removal of dams for the protection of life and property.

Every owner of a dam completed prior to the effective date of the act is required to file application for approval of the dam, this application to be accompanied by such available and appropriate information concerning the dam as may be required.

The construction of any new dam or the enlargement, repair or alteration of any dam can not be commenced until the owner has obtained approval of the plans and specifications. It is required that the application for approval of plans and specifications for a new dam shall set forth the location, type, size and height of proposed dam and appurtenant works; contemplated use and storage capacity of the reservoir and such other pertinent data as may be required concerning foundation conditions, drainage basin area, precipitation, flood flow and other appropriate data.

During the construction, enlargement, repair or alteration of any dam there is required such inspections, investigations or examinations as may be necessary to secure conformity with approved plans and specifications; and in order to insure safety, the State Engineer has authority to order revisions or modifications in the plans and specifications, or, if conditions are revealed which will not permit the construction of a safe dam, the approval may be refused or revoked.

As soon as practicable after completion of any dam it is inspected, and upon a finding

that the work has been done in accordance with the plans and specifications and that the dam is safe for the use contemplated, a certificate of approval is issued. A similar procedure is provided in supervising the repair, alteration or removal of a dam.

Supervision over the maintenance and operation of dams in so far as is necessary to safeguard life and property from injury by the reason of the failure thereof is vested in the State Engineer.

There are at the present time about 650 dams under the jurisdiction of the department, segregated as follows: 400 earth dams, 46 rock fills, 26 timber dams, 97 arch dams and 82 gravity dams. There are some 1000 additional known dam sites, many or most of which must be developed as the needs for additional water demand and warrant.

The dams under jurisdiction vary in height from 15 feet to in excess of 350 feet and in type through the known range of design, namely: earth fill, rock fill, hydraulic fill, gravity and arch masonry types and various composite structures. The reservoirs formed have storage capacities from 10 acre-feet to 1,300,000 acre-feet and spillway capacities up to 120,000 second-feet. These dams are located from sea level to 11,500 feet elevation and are constructed on foundations ranging through the whole geological category. Many heterogeneous types of dams were completed during the early history of California for which no complete authentic records or data are available, and hence all necessary action must be based solely on field examination. It is required by law that a certificate of approval be issued for each dam or that work necessary to make the structure safe be done. Upon completion of this work, certificates of approval are to be issued. This action upon existing dams must be completed prior to August, 1932.

To accomplish the desired objective, namely the determination and establishment of safety of each of these 650 existing dams, in addition to supervising new construction, an experienced and sufficient personnel is being organized to cope with many involved technical and practical problems. The activities of the department are grouped in six general classifications: hydrographic studies, geological examinations, stress and structural analysis, supervision during construction, field examination of existing dams and appurtenant works and supervision of maintenance and operation.

In dams of magnitude or where the technical features involved are such as to require

California Wins Larger Power Fees

Governor Young has received a telegram from Congressman Englebright in Washington that the Comptroller General has sustained the position taken by the State of California with regard to the distribution of Federal Power Commission fees and that the Power Commission will shortly send the state government of California a check for \$108,000 in full payment of back fees under the new method of distribution. The payment due on July 1st under the previous interpretation would have been \$7,000 and \$8,000, so the state will receive approximately \$100,000 more than would otherwise have been the case. Under this decision California will in the future receive from the Power Commission approximately four times the money it would have under the old ruling. These payments may run as large as several hundred thousand dollars a year when the hydroelectric power resources of the state are fully developed.

Governor Young said, "I am pleased to note the new decision of the Power Commission and Comptroller General under which California receives an additional \$100,000 this year and will receive large payments in

the future. I consider this another evidence of the cooperative attitude of the United States in assisting the California water program."

The Federal Power Commission was created in 1920 and since that time has been collecting fees on its power projects throughout the country and distributing these fees to the various states, the Reclamation Bureau and other agencies in accordance with a ruling made by the Commission. In 1928, after an investigation by State Engineer Edward Hyatt of the Federal Power Commission Law and the distribution of fees thereunder, Governor Young reached the conclusion that the state was not receiving its proper share and took the matter up with the Power Commission. After extended correspondence, legal opinions, etc., the question was referred to the Comptroller General, who on February 3, 1930, ruled that the contention of Governor Young and State Engineer Hyatt was correct and that distribution should be made in the future in accordance with California's contentions. Request was then made that this decision be made retroactive and that payment for past years be in accordance therewith.

Snow Survey Shows Extent of Melting

ALTHOUGH the principal snow surveys as a basis for run-off estimates were made in late March and early April, additional surveys have been made in late April and early May at the key snow courses to furnish information for possible modification of earlier estimates and to indicate the extent of melting since April 1st. These later surveys complete the record of monthly surveys. January to May, for the key snow courses and should prove of value, when a sufficient number of years records are available, in relating snow and precipitation data to monthly *distribution* of run-off.

The precipitation to May 1st, in per cent of normal for the major stream basins on the western slope of the Sierra, is shown from the precipitation station data about as follows: Pit, McCloud and Upper Sacramento, 90 per cent; Feather, 100 per cent; Yuba, 85 per cent; American, 80 per cent; Mokelumne to Merced, 70 to 75 per cent, except Stanislaus, where a higher percentage is indicated; and Upper

San Joaquin to Kern, 60 to 70 per cent. The similar data for southern California stream basins show about 80 per cent for Santa Ana and 70 per cent for San Gabriel.

The snow surveys at the key courses show a melting of the April 1st pack as measured at the same courses, about as follows: Above 7500 elevation: Upper Sacramento and McCloud (one course, Mt. Shasta), no melting; Pit and Feather (one course, Mt. Lassen), 33 per cent; American (one course, Carson Pass), 17 per cent; Mokelumne (one course, Blue Lakes), 13 per cent; Tuolumne and Merced (average of six courses), 28 per cent; Mono (two courses), 16 per cent; Upper San Joaquin (one course, Kaiser Pass Meadows), 25 per cent; Kings (one course, Sand Meadows, 8100), 61 per cent; Kern (one course, Round Meadow), 35 per cent. Below 7500 elevation, except for five courses in the Yuba Basin which average 45 per cent, most of the courses show a melting from 80 to 100 per cent of the April 1st pack.

The Architect's Part in the State Work

By HARRY W. DEHAVEN, Chief Architectural Draftsman

LIKE any other art, craft, science, business or profession, the architectural practice of the present day is a product of evolution. The appropriation of the title Architect was the result of a gradual process. Today an architect is a professional person whose occupation consists in originating and supplying artistic and scientific data preliminary to and in connection with the construction of buildings, their appurtenances and decorations; in supervising the operations of contractors, and in preparing contracts between owners and contractors.



HARRY W. DE HAVEN

Probably no one man could unite, with any great degree of excellence, all the attributes which could be alleged as essential to the complete architect. This ideal state

is attained through the acquisition of an organization of specialists, competent in all the technical requirements of the building industry. Such is the Division of Architecture of the State Department of Public Works.

It is this organization that supplies the architectural service required by fifty different points of activity controlled by the state. Many of these points are institutions, and in effect are small cities with very unusual type of buildings required for their particular need. The accumulation of data on this specialized service renders this office more efficient in the production of the drawings and specifications for subsequent buildings at a much less office expenditure than was charged against the first.

There is an average of approximately \$10,000 worth of business produced daily by the Division of Architecture. The method in which part of this business is produced is after this manner:

Executing preliminary studies for all state buildings and developing the problems;

Investigating and selecting materials of construction, both concealed and exposed;

Preparing working drawings in detail, including scale and full-size detail. This method shows the contractor exactly what is required, and permits us to push the contractor to the limit after the contract is awarded and robs him of the usual excuse for delays, "Waiting for Details";

Designing and selecting fixed and movable furniture;

Interpreting building laws, etc.

The following subdivisions are found in the Division of Architecture:

Structural Design, Mechanical Design, Electrical Design, Surveying, Estimating, Specifications, and Superintendents of Construction.

The buildings constructed by the state are mostly of the one- and two-story type, built of reinforced concrete or brick because of their use and the nature of their occupants. State buildings of all kinds are noted as suitable for their purpose—strong, substantial and durable. They are the acknowledged criteria of good construction. This office has always given the first consideration to the importance of these factors.

Architecture may be defined as the art of building beautifully and constructing soundly. There is no formula that produces good architecture.

The architectural draftsman plays an important part in making a design a success, as it is he who develops the working drawings. He must be able to interpret in building terms the designer's idea in the form of drawings that the contractor can understand. Each set of drawings are thoroughly checked before being sent out for bids. This eliminates any chance of costly extras due to mistakes or misunderstanding on the part of the contractor as to just what is required.

The drawings for most of the buildings are made on tracing cloth in ink, and after all prints have been made, are filed as a permanent record. Should any change be made during construction, it is noted on the original drawings that a change order has been issued. In this way future alterations or additions can be made without making trips to the job and measuring the existing work, which saves considerable time.

(Continued on page 16.)

Scenic Glimpses of State Buildings



Annex to School Building, California School for the Blind, Berkeley



The Old Plank Road Through the Sand Dunes and the New Highway

Old Plank Road to Be Preserved

By E. Q. SULLIVAN, District Engineer

SEVERAL weeks ago an editorial appeared in the *Calexico Chronicle* by the editor and publisher, Mr. Randall Henderson. The editorial follows:

A plea for the preservation of the old plank road—or what remains of it—which spanned the rolling sand dunes east of Imperial Valley before the paving was installed, is made in a recent issue of the *Arizona Sentinel*.

The *Sentinel* writer recalls some of the obstacles which confronted the state engineers when they undertook to replace the planking with cement. One group of experts declared that if the grade was low the blow sand would cover the highway. Another group insisted that if the road was high the wind would blow the sand from under it.

The State Highway Department solved the problem by placing an engineer on the location for a period of observation. The present highway is the result—and its success has vindicated the judgment of those who made the final decision.

Here is the *Sentinel* writer's comment:

"The old plank road, which for years was the only highway crossing the sand hills, connecting Yuma with Imperial Valley, is being carted away by vauldals. Since the coming of the hard-surfaced pavement, the old plank road has not been used; neither has it been forgotten.

Stretched for miles paralleling the highway it is always an interesting sight, not only to the tourist, but to those who have made the tedious trip across its many boards, bound together with iron strips. It is true that the planks are buried in many places, but the manner in which they yet shift with the sands and withstand the ravages of time and elements cause one to marvel at the ingenuity of the men responsible for the building of such a highway.

The name of the 'old plank road' is famous throughout the country. Tourists come this way just to see how we traveled across the sand hills years ago. It is really an interesting sight and should be left just where it is, or until the sands cover it over. It is not in the way and is on no one's property. Let's try and stop further despoliation of one of the southwest's most famous and interesting marks."

Thought had not been given to the preservation of the old plank road, and in fact the Imperial Irrigation District, being a public organization, had been given permission to use such planks as they might desire. The idea of preserving the old plank road as being an object of historical interest seemed good, and a letter was written by the Division of Highways to the Imperial Irrigation District as follows:

I have received a clipping from the *Calexico Chronicle* in which a plea is made for preservation of the old plank road across the sand hills because of its historic value. This is our route Imp-27-43.

You will recall that a number of years ago permission was requested from the Imperial Irrigation District to remove planks from the old road for use of the district. It is my recollection that this permission was granted the district.

I have not noticed that many, if any, of the planks have been removed from the old plank road by the Imperial Irrigation District.

In view of the local suggestion that the old plank road be preserved because of its historic value, please advise if the Imperial Irrigation District still desires to remove planks from the old road.

If it is still desired to use planks from the old plank road, please advise if it will not be satisfactory to remove only such parts of the old plank road as are beyond sight of the new highway.

I have received the following letter from the Imperial Irrigation District:

The district is in accord with the suggestion you make in your letter of April 11th regarding the old plank road across the sand hills. It is true we contemplated using the planks, but found that the cost of taking up and hauling to the valley was not economical. I think it is a fine idea to preserve the plank road, at least that portion in sight of the highway, and we will be glad to cooperate with you in doing this.

Yours very truly,

(Signed) M. J. Dowd,
Chief Engineer and General Superintendent.

Uniform Traffic Laws Termed Problem for States and Cities

FINAL recommendations for nation-wide uniformity of traffic rules and regulations on the municipal and state thoroughfares of the country were adopted by the drafting committee of the national conference on street and highway safety which concluded its three-day sessions May 29 in Washington, D. C. The State Department of Public Works and the California Highway Commission was represented at this meeting by State Highway Engineer C. H. Purcell.

The following account of this important conference is contained in *The United States Daily*:

The Secretary of Commerce, Robert P. Lamont, at the conclusion of the meetings, declared it is now up to the states and municipalities to carry on the recommendations adopted.

"I think the deliberations of the conference," he told the delegation, "are a convincing guaranty that they will have the earnest support of the organizations and associations which have been represented here."

The report of the drafting committee was presented to the conference by George B. Young, delegate from Montpelier, Vt., for the national conference of commissioners on uniform State Laws. The report, it was announced, did not make any material changes in the uniform vehicle code or the model municipal traffic ordinance as they had been originally presented to the conference.

RAIL SIGNALS MODIFIED

Upon the motion of W. N. Doak, national legislative representative of the Brotherhood of Railway Trainmen, and the concurrence of Dr. Julius H. Parmelee, acting chairman of the committee on railway grade crossings and highway intersections, it was agreed to broaden the language of the code relating to signaling devices and warning signs at cross-

ings so as not to hamper or interfere with the future development and improvement of these mediums of protection.

An effort to remove the provision requiring inspection of automobiles as to mechanical fitness and safety prior to issuance of license tags was met with rejection at the hands of the delegates. The belief that the provision would impose an unduly heavy tax upon the public authorities in connection with the licensing of automobiles and doubt if it could be carried out in his state was expressed by H. B. Myers, chief of police of New Orleans.

Defending the provision, George W. Elliot, general secretary of the Philadelphia Chamber of Commerce, declared that under the statute of the state of Pennsylvania 1000 defective and unsafe automobiles have been removed from the highways of his state in a single year and that defects in 2000 others were remedied.

Mr. Elliot pronounced the Pennsylvania law as one of the strongest factors for safety on the streets and highways in his state, and declared no inconvenience or delay is experienced by motorists in obtaining their annual licenses as a result of the operation of the law. He asserted that it would be a

distinct backward step for the conference or for any state or city to refuse to support the proposal for the mechanical inspection of motor vehicles.

SPEED LIMITS FIXED

Included in the recommendations adopted by the conference are provisions fixing a 20-mile-per-hour speed limit in business districts, 25 miles in residential districts and in public parks within cities, and 45 miles outside of business and residential districts.

With respect to slow driving the code declares: "It shall be unlawful for any person



State Highway Engineer C. H. Purcell, who attended National Safety Conference at Washington, D. C.

unnecessarily to drive at such a slow speed as to impede or block the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or because upon a grade or when the vehicle is a truck or truck and trailer necessarily in compliance with law proceeding at reduced speed."

Concerning passing of vehicles proceeding in opposite directions to code requires that drivers "shall pass each other to the right, each giving the other at least one-half of the main traveled portion of the roadways as nearly as possible."

RULES FOR OVERTAKING

Regarding overtaking and passing cars the recommendations provide that the driver of an overtaken vehicle "shall give way to the right in favor of the overtaking vehicle on suitable and audible signal and shall not increase the speed of his vehicle until completely passed by the overtaking vehicle."

It is also required that "the driver of a vehicle shall not drive to the left side of the center line of a highway in overtaking and passing another vehicle proceeding in the same direction unless such left side is clearly visible and is free of oncoming traffic for a sufficient distance ahead to permit such overtaking and passing to be completely made without impeding the safe operation of any vehicle overtaken."

When approaching curves, etc., the code rules against driving to the left side of the center line of a highway "when approaching the crest of a grade or upon a curve in the highway where the driver's view along the highway is obstructed within a distance of 500 feet."

With respect to municipal traffic regulations, the recommendations provide that a left turn at an intersection be made on the green light. The regulation, as contained in the model municipal traffic ordinance, declares that "the operator of a vehicle or street car intending to turn to the left at an intersection where traffic is controlled by traffic control signals or by a police officer with proper care to avoid accident and shall proceed to make such left turn only upon the 'go' signal, unless otherwise directed by a police officer."

The conference expressed its approval of the cooperation of the various public organizations in solving the traffic problem and passed a resolution offered by H. S. Bottenheim, editor of the *American City*, calling upon Secretary Lamont to appoint a committee to consider the establishment of a national foundation for the study of congestion and public safety.

LACK OF DATA HANDICAPS COMMITTEE

The resolution follows in full text:

"Whereas, the various committees of this conference, in their efforts to base their reports not on opinions but on facts, have been seriously handicapped by the lack of authoritative and comprehensive data on many vital phases of the traffic, transportation and safety problems; and congestion in urban communities is of growing importance and complexity, with resultant economic loss conservatively estimated at \$2,000,000,000 annually and an appalling annual toll in human lives and suffering; and

"Whereas, there is a close relationship between congestion of vehicles on the city streets and city planning, highway design, land utilization, and the public transit facilities of the community; and

"Whereas, public authorities, civic organizations, property owners, business, financial and insurance interests, transportation agencies, automobile manufacturers and owners of automobiles are interested in

the development of measures, both corrective and preventive, for the relief of congestion which shall bring about the greatest possible improvement at minimum costs, equitably distributed; now, therefore, be it

"Resolved, (1) that the third national conference on street and highway safety urgently requests the cooperation of the federal government, through such technical research and fact-finding experimentation as could properly be conducted by the Bureau of Public Roads of the Department of Agriculture, the Department of Commerce, and other governmental offices; and to this end the conference earnestly recommends to the Congress of the United States that necessary legislation be provided to permit the proper governmental agencies to conduct such research and experimentation upon important phases of the traffic and congestion problem, and to cooperate in these matters with municipal and other local authorities.

COMMITTEE FOR NATIONAL ORGANIZATION SUGGESTED

"And (2) That the conference further requests that the Honorable Robert P. Lamont, as its chairman, appoint a committee to consider ways and means of establishing a national foundation, nongovernmental in character, equipped with the funds and manpower adequate to conduct comprehensive studies of such problems of congestion affecting public safety, the stability of property values and the orderly development of urban communities, as are indicated on the list appended hereto. It is suggested that, in its research on these and similar problems, the proposed foundation use as fully as practicable the cooperation of existing organizations and educational and research institutions in their respective fields.

The conference also expressed in a resolution its gratification to President Hoover for his leadership in the movement for uniform recommendations. The resolution follows in full text:

"Under the inspiration of your appeal to this conference at its opening meeting to promulgate effective measures for the reduction of traffic accidents and congestion, the conference has considered and adopted reports covering every phase of this vital and complex problem, and the members thereof, representing nearly every state and important civic or business group in the nation, return to their communities and to their official, professional and business responsibilities inspired with a deep determination to make the recommendations of this conference effective, so that your confidence in us may not have been misplaced.

SAFETY GREATLY ADVANCED BY UNIFORM STANDARDS

"The uniform standards and recommendations approved by this conference represent, it is confidently believed, a great advance in the principles of safe use of public streets and highways, resulting from the cooperative and cumulative efforts of traffic leaders throughout the nation, made possible by your wisdom and foresight in organizing the national conference in 1924.

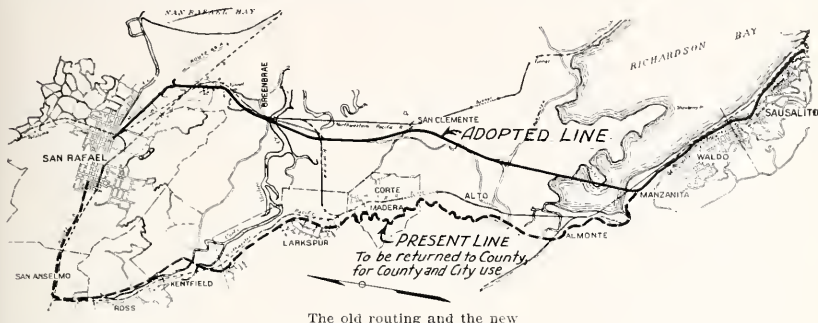
"Before adjourning we wish once more to express our gratitude for your leadership in this movement, and we believe and expect that the future will demonstrate the ability of the American people to solve or at least ameliorate this problem."

Secretary Lamont in addressing the conference at the conclusion of its sessions said:

"The deliberations of this conference have, I think, been impressive in two respects. They have brought into clear perspective the gravity and complexity of the problem with which it has dealt and indicated practical methods by which it must be approached.

(Continued on page 40.)

Improved Routing is Formally Adopted



THE recent adoption by the California Highway Commission of the location for state highway from a point near Alto across the head of Richardson Bay into Sausalito, completes the revised routing between San Rafael and Sausalito of the southerly terminal of the Redwood Highway, State Highway Route No. 1. The adopted route shortens the distance between these two towns by four miles over the present traveled road. It will remove a large volume of through traffic from the many congested areas encountered in the various towns through which the present highway passes. It will eliminate the crooked and steep Corte Madera grade and the traffic hazards occurring at the many intersections encountered on the present highway. The superior alignment, grades, and shorter distance will permit of an appreciable saving in time for traffic.

From Manzanita to Sausalito the new route coincides very nearly with the existing road, making provision, however, for revisions which will eliminate the bad curvature and permit of widening this important highway to an adequate width to properly serve traffic. The location from Sausalito northerly will better serve the large volume of traffic and affords the best opportunity for a possible future connection to the proposed Golden Gate bridge.

Grading of the new location has been practically completed from San Rafael to Alto, and a contract has been awarded for the placing of a bituminous pavement on this graded portion. Additional funds are available in this budget program for carrying the construction southerly from Alto across the head of Richardson Bay. Plans for this additional

section, including a bridge across the bay, are now being prepared and will be advertised for contract before the end of the year.

SAFETY RULES CITED

Every careful automobile driver realizes, in this modern day, that he is constantly facing the possibility of accidents, either to himself or to some other person.

1. Be sure that your brakes are in good working order. Inspect them frequently.
2. Keep your mind on your driving, and anticipate sudden emergencies.
3. Obey all traffic and parking regulations.
4. Keep to the right, and comply with road markings and signs.
5. Signal for stops and turns. Watch the car ahead.
6. Slow down at crossings, schools and dangerous places.
7. Never pass cars on hills, curves, or crossings.
8. Adapt your driving to road conditions, rain, ice, soft spots and ruts.
9. It doesn't pay to take the "right of way" too seriously.
10. When you drive, remember the other times when you are a pedestrian.
11. Consider the right and privileges of others.
12. Know the law. It was passed for your protection.

Twenty of the forty-eight states of the Union require drivers of motor vehicles to have operators' licenses, the Division of Motor Vehicles has announced as a result of a survey of requirements by the various states. While some of these states issue licenses merely upon application of the prospective driver, most of them require the applicant to undergo an examination of his mental and physical fitness to drive as well as his experience.

Letters Tell of Service Given By Traffic Officers

Despite the little unpleasanties of his calling, the traffic officer receives something frequently from the public besides brickbats.

So much is gleaned from what Roy W. Youngblood, assistant superintendent of the California Highway Patrol, dubs his "bouquet file" containing many letters of thanks from motorists for small favors extended them by the officers in carrying out the patrol's policy of courtesy to the public.

While an irate driver writes in occasionally to complain because he was "clocked" doing 60 miles an hour, the bulk of the letters come from those who received help when they ran out of gas, were assisted in starting a balky engine, in patching or changing a tire or were otherwise helped in one of the numerous little things that is part of the traffic officer's daily grind.

"We are trying to have the public cease to fear the traffic officer and to regard him as a friend," Youngblood explained.

One letter expresses the thanks of a grateful Stanislaus County farmer for assistance offered by the night patrol in putting out a fire in his chicken house. Another tells of an officer who raced for a doctor when a baby of a stranded motorist developed convulsions. Another expresses thanks to an officer who secured help from a distant garage when a bearing went out.

The file contains a letter from Governor C. C. Young indicating the executive is much impressed with the spirit of helpfulness exhibited by the officers toward the public. Governor Young's attention was drawn to this phase of the work recently when he noticed a motorist apparently in trouble along the roadside in Solano County. Two miles farther Governor Young met traffic officer Leo J. Boyle and informed him of the situation.

Without knowing the identity of the Governor, who was traveling in a private car, the officer thanked him for the information and, mounting his motorecycle, went at once to the assistance of the stranded motorist. The officer was surprised to find out later that his informant had been none other than the state's chief executive.

According to present plans the new highway between Laredo, Texas, and Mexico City will be open for traffic by fall of this year.

Here Is Picture of Typical Driver-Victim In Auto Accidents

From the United States Daily

In an attempt to answer the question of who is the typical motor vehicle driver causing fatal accidents and who is the typical victim of such accidents, the committee on street and highway safety appointed by the Governor of Massachusetts has analyzed the detailed reports of all automobile fatalities in the state last year and has evolved two composite characters.

The person who caused such accidents in 1929 is identified by the statistics, states the committee, as follows:

He was a physically perfect, sober, alert man, over 25 years old, who had driven an automobile for more than five years. He was driving a passenger car equipped with two-wheel brakes in perfect order, as was also his emergency brake. His lights and other equipment were in good condition. He was driving in daylight, between 6 and 7 o'clock on a beautiful, clear Sunday afternoon, proceeding straight ahead on a straight, smooth bituminous pavement, the surface of which was absolutely dry. There were neither obstructions on the highway nor to the driver's view. On the other hand, there were no traffic lights and there was no traffic officer on duty. The location was a thickly settled residential district, yet the driver was moving at more than 25 miles an hour. He was going too fast for existing conditions and was to blame for the death.

The victim is identified by the committee, likewise, through a study of the statistics, as follows:

He was a physically perfect, sober, attentive man, over 55 years old. He was crossing the street between intersections in the same district through which the "killer" happened to be driving. Aside from the fact that he did not attempt to cross the street at its intersection, he was not otherwise at fault. He died of a fractured skull.

SPEED FOR NIGHT DRIVING

What is the proper speed for night driving?

This question often has been asked and answers are varied, but the Mississippi Supreme Court has just handed down an opinion which, it is believed, will not only insure safety, but will act as a precedent for other court decisions.

The case in question reversed the judgment of the lower court and the decision was that "an automobile driver at night should be able to stop within the range of headlights of the car."

The Connecticut Department of Motor Vehicles' analysis of accidents of the eastern state, shows that automobile accidents are more likely to occur at intersections of good road surfaces, during daylight, in clear weather, on June Sundays.

Highway Use in California Shown To be Greatest in United States

CALIFORNIA leads the nation in the amount of gasoline consumed for highway use, according to statistics compiled by the United States Bureau of Public Roads. The net total of gasoline taxed and used by motor vehicles in California in 1929 was 1,139,736,244 gallons. Pennsylvania came second and New York third.

The 48 states and the District of Columbia collected \$431,636,454 in taxes on the sale of 13,400,180,062 gallons of motor fuel in 1929, reports received by the Bureau of Public Roads of the U. S. Department of Agriculture show. This includes a 12-month collection in 46 states and the District of Columbia, a 5-month collection in Illinois and the collections of 8 months in New York. Illinois and New York were the last states to adopt this method for part payment of the highway bill. The pioneer states—Oregon, Colorado, North Dakota and New Mexico—led the way in 1919. Now all the others have followed, but the tax did not become effective in New York until May 1 and in Illinois until August 1.

The average fee per gallon was 3.22 cents as against 3 cents in 1928. In the course of the year 20 states increased the rate of taxation either one or two cents. The highest tax per gallon was 6 cents; the lowest 2 cents. At the close of the year, three states had a 6-cent tax; eight a 5-cent tax; 19 a 4-cent tax; one, Utah, a 3½-cent tax; 10 a 3-cent tax and seven states and the District of Columbia a 2-cent tax.

In 1929 the rate per gallon was increased one cent in Colorado, Florida, Indiana, Kansas, Minnesota, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, Vermont, Washington and Wyoming; 2-cent increases became effective in Georgia, Louisiana, Montana, Nebraska, Tennessee and Texas.

Comparison of the total number of vehicles registered in 1929, with the total tax collected and with the taxable gallonage in all states (except New York and Illinois) and in the District of Columbia shows an average tax revenue of \$17.72 per vehicle and an average purchase of 532 gallons of gasoline.

After deducting collection costs, the entire net revenue in 34 states was used for construction and maintenance of rural roads. In the other fourteen states and the District of Columbia, a total of \$24,405,207 was used for other purposes. In three states part of the tax money helped support public schools. In eight states, a part of the revenue went to cities for repair and improvement of streets, as did the entire collection for the District of Columbia. In six states, small sums were deposited in general funds; in Mississippi, a special, extra tax was collected in two counties for seawall protection of highways and in New Jersey a small fraction of the

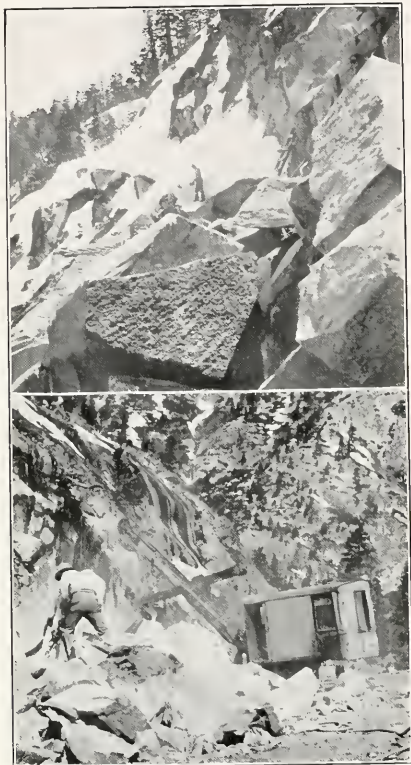
receipts was turned over to the Department of Commerce and Navigation.

Of the revenue applied to rural roads, \$297,967,756 was used for construction and maintenance of state highways; \$85,113,708 for construction and maintenance of local roads; and the remainder, \$23,371,785, applied as payments on state and county road bonds.

The following table shows the total number of gallons taxed in the several states:

<i>State</i>	<i>Net gallons of gasoline taxed and used by motor vehicles</i>
Alabama	178,162,903
Arizona	63,995,783
Arkansas	133,620,566
California	1,139,736,244
Colorado	141,466,891
Connecticut	202,354,590
Delaware	31,198,248
Florida	223,373,467
Georgia	219,609,473
Idaho	48,658,984
Illinois	388,659,266
Indiana	410,936,759
Iowa	311,859,516
Kansas	288,716,546
Kentucky	154,717,831
Louisiana	176,645,631
Maine	91,610,422
Maryland	157,429,197
Massachusetts	487,940,778
Michigan	710,300,302
Minnesota	338,631,771
Mississippi	140,902,401
Missouri	384,033,575
Montana	57,514,249
Nebraska	208,869,358
Nevada	16,307,535
New Hampshire	56,676,294
New Jersey	498,063,808
New Mexico	45,479,332
New York	962,601,285
North Carolina	260,210,528
North Dakota	71,591,708
Ohio	910,154,885
Oklahoma	314,388,292
Oregon	152,090,900
Pennsylvania	1,047,914,175
Rhode Island	77,826,879
South Carolina	118,068,130
South Dakota	88,644,138
Tennessee	194,497,225
Texas	761,421,692
Utah	56,546,967
Vermont	43,990,554
Virginia	197,898,821
Washington	223,333,570
West Virginia	121,654,788
Wisconsin	374,251,967
Wyoming	34,242,816
Dist. of Col.	71,469,032

WHEN ROCK IS ROCK



These are pictures of solid rock excavation along the new state highway north of Bay View Rest on the Lake Tahoe road in El Dorado County.

Excavation along the entire project is at the rate of 50,000 cubic yards per mile, ranging from 80,000 cubic yards per mile of solid rock, as shown in the photographs, to 21,000 cubic yards per mile of boulders and cemented clay to 50,000 cubic yards per mile of loose rock, boulders and disintegrated granite.

The photographs were taken April 8.

The elevation above sea level of the work photographed is 6500 feet.

BELIEVE IT OR NOT

Mr. W. F. Holbrook, maintenance superintendent of District Four, reports a rather unique adventure.

A short time back, while driving down King's Mountain on the Skyline Boulevard, Mr. Holbrook noticed an extremely large hawk gracefully sailing overhead a short distance in front of him. The hawk suddenly swooped down upon an unsuspecting cottontail rabbit sitting on the top of a heavy cut just ahead.

However, in attempting to escape with his prey the hawk found he had a little more than he could carry, but refused to let go and gradually dropped until he was directly in front of the car in which Mr. Holbrook was driving. The latter, sensing the collision, applied his brakes, but was unable to stop in time. Hawk and rabbit struck the windshield of the car, demolishing it completely.

After bringing the car to a stop and recovering somewhat from the shock, Mr. Holbrook found the hawk returning to consciousness on the front seat of the car beside him, with a death-like grip on the right cuff of his coat sleeve.

The rabbit was found completely shattered between the front fender and the hood of the engine, so tightly imbedded by the impact that it was difficult to remove him.

Mr. Holbrook is still trying to find out how he managed to escape with but three minor cuts from the flying glass of the shattered windshield.

THE ARCHITECT'S PART IN THE STATE WORK

(Continued from page 8.)

In some instances the work is done by day's labor or inmate labor, and the Division of Architecture acts in the same capacity as general contractor, ordering all material. In this case, requisition drawings are made showing shape and quantity of material required for such as millwork, sheet metal, ornamental iron, cast stone, terra cotta, etc., and bids are taken for each material separately.

The final link in our service to the state is superintendence. We make this a real service.

BRITISH COLUMBIA—Increased amount and speed of traffic is responsible for the construction of highways with wider rights of way in this province.

Control by
Roadside Burning
Commended.

Railroad to
Remove
Billboards from
Highway
Frontage.

Clippings, Letters and Comment

Dealing with State Highways

Condition of
Mountain High-
ways Praised.

Lassen Main-
tenance Station
Beautified.

Palm Planting on
Southern Road.

Roadside Burning Is Commended.

C. C. Cottrell, secretary of the Stop Forest Fires Committee of California, writes to Director Meek as follows:

At a meeting of the Stop Forest Fires Committee of California, held in San Francisco last week, I was instructed to write you regarding the activities of your department in the way of destroying for fire prevention purposes the grass, weeds and brush growing along the roadsides.

The committee was of the opinion that notwithstanding some temporary defacements that occur and a few complaints made by certain citizens of the state, that the work was entirely justified. It was stated that what we are all after is to prevent worse and irreparable scars.

The committee instructed me to commend your department for its activities in this direction.

Express Appreciation for Road Improvement.

This letter comes from the Mill Valley Chamber of Commerce:

The Mill Valley Chamber of Commerce, which met on Wednesday, May 28, 1930, wish to commend your appropriation of \$80,000 for the development of the Alto-Tiburon highway, as well as your announced intention of immediately proceeding to the completion of that section of road.

Southern Pacific To Remove Billboards from Lands.

The Southern Pacific Railroad in a letter to C. H. Purcell, State Highway Engineer, has promised its full cooperation in the elimination of billboards from its land fronting on the state highways.

The following letter has been received by Mr. Purcell from E. A. McAllaster, land commissioner of the company:

In response to yours of the 21st ult., concerning your finding of many unsightly signboards lining state highways in southern California situated upon lands belonging to Southern Pacific Land Company.

Southern Pacific Land Company has not authorized the construction of any signs upon any of its lands abutting upon state highways in southern California.

The Division of State Highways is hereby authorized to act on behalf of Southern Pacific Land Company in any lawful and appropriate manner in accomplishing the removal of any signs which may exist upon Southern Pacific Land Company lands abutting upon state highways.

This authority, however, applies only to unsold lands of the company. If such signs are found to be upon lands covered by outstanding sale contracts jurisdiction in respect thereto rests with the contract holder.

If any signs are noted as being situated upon Southern Pacific Land Company lands, but at such a distance from the highway as renders them unobjectionable so far as the Division of Highways is concerned, I will be obliged if you will, as such discoveries are made, inform me of the location, character and wording of the sign, and the name of the party who apparently is responsible for its construction or is benefited by its use.

Maintenance of Mountain Highways Is Commended.

Major Evan W. Kelley writes from Washington, D. C., to his boyhood friend, Jack Reid, maintenance foreman on the Downieville lateral, as follows:

Ever since my trip at Christmas time to Downieville and home, I have intended to drop you a line to compliment you on the excellent maintenance work you are doing on the highway leading into our old town.

The standard you have attained is not excelled east, west, north or south, on earth roads; at least I have never encountered a superior demonstration of the art of dirt road maintenance anywhere, and since leaving California it has been my fortune to have covered many thousands of miles of highways and byways in every state of these United States of ours. Again I congratulate you.

Lassen Maintenance Station Beautified.

The Susanville Mail records the following improvement:

The maintenance station of the State Highway Commission on the Johnstonville road has undergone an extensive landscape change during the past two weeks, and when the work is completed and the lawns, plants, flowers, trees and shrubbery have grown, the

station will present a very pretty and artistic appearance.

The beautifying of this station fits into the general scheme of the State Highway Commission of landscaping all the highway stations in the state.

The area of the local station is two acres. Trees have been planted around the yard and three lawns have been seeded. Forty Arizona ash trees and thirty native cedars as well as an abundance of shrubbery have been planted. Along the front fence on the north side climbing wild rose has just been put in, and along the east side of the fence yellow jasmine has been planted. A very hardy collection of fine Chinese chrysanthemums have been planted and the natural wild sagebrush hedge that has been put in is the first of its kind ever attempted in this locality.

* * * * *

Snook Outlines License Policy.

No immediate steps will be taken toward cancellation of operators' licenses issued in 1927 and 1928, it was announced here today by Frank G. Snook, chief of the Division of Motor Vehicles.

Such licenses are valid and will remain so until canceled, Snook said.

The motor vehicle chief explained that the files had been brought up to date by the drive made last year against holders of obsolete licenses when several hundred thousand renewals were made.

"It probably will be at least a year before we make any attempt to cancel licenses issued in 1927 and 1928," Snook said.

"We feel there is no particular reason for doing it at this time and that cancellation of these licenses would only be a hardship on the motorists and an expense to the state."

* * * * *

Palms to Adorn Southern Road.

The following is from the San Bernardino Sun:

Beautification of the Ocean-to-Ocean highway between Redlands and the Santa Ana River bridge, east of Colton and south of San Bernardino, will be started immediately. This announcement came recently from J. E. Stanton, district maintenance engineer for the State Highway Commission.

Four hundred Washington palms are to be brought from the Coachella Valley to line the Redlands-San Bernardino link of the transcontinental motor highway, said Mr. Stanton. The palms, already potted at Indio and made ready for transplanting, range from two to five years of age.

* * * * *

Drivers Must Obey School Bus Law.

Rigid enforcement of the law requiring drivers of motor vehicles to come to a stop immediately before passing school buses load-

ing or unloading school children was ordered today by Eugene W. Biscailuz, superintendent of the California Highway Patrol.

Pointing out that nearly one-third of the traffic fatalities are children under 9 years of age, Biscailuz instructed inspectors and squad captains to pay particular attention to this phase of enforcement.

The state law requires motor vehicles to stop before passing buses loading or unloading children and to proceed then at a speed not greater than ten miles per hour and with "due regard for the safety of the children."

* * * * *

Publisher Urges Tree Planting on Highways.

Alfred E. Harrell, publisher of the *Bakersfield Californian*, when he gave a talk last week at the Delano Woman's Club, spoke of the planting of trees on the highway between Delano and Bakersfield, says the *Delano Record*.

Mr. Harrell has been an ardent exponent of beautifying the highways of Kern County, and he has spent some time on the tree proposition.

He had recently talked with Bert Meek of the State Highway Department, and where the highway has been widened to 90 feet trees will be planted. The state will select the variety of tree, but they will be paid for by the community through which the road passes. The first year the state will care for the trees for a flat sum of \$2.25 per tree. There is a 10-mile stretch now ready for planting.

Speaking of the financial aspects of the tree planting, Mr. Harrell stated it would cost about \$2,400, and that he had decided to make himself a committee of one to raise the money.

"If every man, woman and child will help, there will be no difficulty in raising funds, and by March of 1931 we can have an historic Arbor Day at Delano. The trees can be continued down the highway, and finally connect with Bakersfield."

* * * * *

Pedestrians' Rights Protected by Courts.

The Division of Motor Vehicles has called the attention of motorists of California to the fact that the courts of this and other states, in recent months, have held almost unanimously that pedestrians have the right of way over motor vehicles.

Desirous of informing the motorists of the need of careful driving where pedestrians are concerned, the division's bulletin pointed out

that court decisions have held that motor vehicles are required to give way to pedestrians and that pedestrians have frequently collected heavy damages from motorists who failed to do so.

"The large number of fatal accidents involving pedestrians and the fact that the courts almost invariably award damages to the pedestrian-plaintiff should be sufficient reason for extreme care in crowded streets and on highways used by pedestrian traffic," the bulletin said.

The bulletin said recent decisions by the courts have produced the following points in favor of the pedestrian:

1. The pedestrian has the right to use all parts of the highway, being chargeable only for the exercise of a due amount of care.

2. The pedestrian hit and injured in the center of the street can not be considered as negligent because he was there instead of on the sidewalk.

3. The pedestrian is not guilty of negligence because he fails to look behind him. The pedestrian is not bound, as a matter of law, to be looking and listening continuously to see if motor vehicles are approaching.

4. The rule of reasonable precaution requires that the driver be certain the pedestrian is aware of the approach of the vehicle at such distance as to avoid running over him.

5. The driver who strikes a pedestrian because he was blinded by the sun or lights can not escape responsibility by offering this as an excuse.

STATE SUPERVISION OF DAMS

(Continued from page 6.)

it or when controversial issues are involved, the State Engineer avails himself of the services and advice of consultants experienced in the particular phase under consideration to report upon these technical matters that a proper and sound solution of the problem may be reached.

It is the aim and endeavor of the department, rigidly adhered to, to require that the personnel refrain from forming conclusions on the basis of local or prejudiced influence, imposing unwarranted or dictatorial conditions beyond the requirements of safety, exerting unnecessary influence over construction, assuming engineering direction, or directing economic considerations such as choice of type, location, etc. It is likewise the desire of the department to minimize inconvenience to the owner, eliminate transgression on the engineering profession and cause a minimum disturbance of economic conditions. On the other hand, the personnel stands, at all times, willing to discuss, informally, with the engineer acting for the applicant controversial

problems of design or construction relating to the safety of the dam.

To the end that uncertainty, needless expense and inconvenience to the owner as well as the supervisory agencies may be minimized, an agreement has been effected by the State Engineer with the Federal Power Commission, U. S. Forest Service and the California Debris Commission providing a cooperative procedure for carrying on the activities of the agencies having joint jurisdiction over dams.

An analysis of records discloses that a major number of dam failures has resulted from inadequate spillway provisions and foundation or abutment insufficiencies. Where ordinary care has been exercised in the design or construction of a dam instances of failure within the structure itself have been extremely rare. This indicates not that less thought and effort be directed to technical design, but rather that more thought, and competent thought, be applied to geologic and hydrographic study.

State supervision of dams, if properly and competently administered and if directed aggressively to the proper requirements of safety in dam design and construction merits the support of the engineering profession in maintaining public confidence and advancing the technique of the profession; assures the public of unbiased and uninfluenced engineering opinion; dispels inherent public fear of dams; centralized and makes for uniform co-ordinated control, and records and makes available in condensed permanent form technical information and data of inestimable value. State supervision of dams should, however, be ever cognizant of the fact that the advancement of any community depends upon the development of its water resources through the construction of dams. Obviously this program must not be retarded through over-cautious and unwarranted functioning of the office having jurisdiction beyond reasonable requirements for assurance of safety.

A HOT ARGUMENT

Never helps develop cool judgment.
Is a poor way to make warm friends.
Seldom settles any real differences.
Can not be conducted in low tones.
Means tongues in high with brains in neutral.
Never smoothes any old animosities.
Seldom increases anyone's self-respect.—From *Farm Bureau Monthly*.

The number of motor cars now going to the scrap heap annually is nearly three times the volume of new car production in 1916, when the country's modern road-building program actually began.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

E. B. MEEK-----Director
GEORGE C. MANSFIELD-----Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 8 JUNE, 1930 No. 6

Added Care in Vacation Urged on Autoists by Governor

Calling attention to the fact that the approaching end of the school term in California will release thousands of children for play, Governor C. C. Young today urged motorists to be on the lookout for children in the streets and along the highways during the vacation season.

Concurrent with the Governor's statement, orders were issued to members of the California Highway Patrol to enforce strictly provisions of the law limiting speed in residential districts and to spread the warning to drivers to watch for children.

Records of the Division of Motor Vehicles show motor deaths among children are always heaviest during June, July and August.

Governor Young said:

"Every driver of a motor vehicle is asked to exercise the utmost caution during the coming school vacation period. Thousands of children will be playing in and along the streets and unless watched carefully will often get in the path of moving vehicles. Help us reduce this toll of young lives by doing your share."

NEW HAMPSHIRE—In the construction of the new Whitefield-Lancaster road through the White Mountains care was taken to preserve every natural beauty spot. Careful trimming and cutting has, in fact, added to the charm of this road.

A news story tells of a nonstop auto driver collapsing at the wheel of his car, after driving 201 hours.

Our hearty sympathy goes out to the driver—we, too, have tried to find a place to park!—*The Garage-man.*

Value of Public Work Program Told by Savant

California is witnessing the largest construction program in its history at a time when the need of construction activity is the greatest. The importance of just such a construction program that California is today enjoying was recently discussed by Dr. John M. Gries, chief of the construction division of the Department of Commerce, in an address before a conference on construction in connection with the annual meeting of the Chamber of Commerce of the United States.

Here are some of the things that Dr. Gries said:

During business depressions, when domestic industry, commerce and trade are at a low ebb, we may look in two directions for possible relief or stimuli, namely: (1) foreign trade, and (2) construction. Foreign trade is of great importance and every effort should be made to stimulate such trade, but if the depression is world-wide, it is difficult to enlarge or expand this important safety valve or spillway.

The annual expenditure for construction and upkeep in the United States amounts to about \$10,000,000,000. This is equal to about three-fourths of the total value of all farm products or to more than the value of all our imports and exports.

During depressions, many of our domestic industries, even if financially able, can not produce for stock to any great extent, for their products are more or less perishable or subject to market depreciation or obsolescence. The products of construction, however, are more durable, and in some lines we are many years behind our needs; for example: in grade eliminations, railroad crossings, highways, waterworks, flood control, river improvements, etc.

If we were to pick out a single industry whose increased activity would stimulate the largest number of other industries, that industry would be construction, for construction is the major market for the products of more than 20 important domestic industries, such as iron and steel, cement, lumber, brick, sand and gravel, hollow tile, copper, hardwood, terra cotta, millwork, plumbing equipment, lighting equipment, heating equipment, sanitary ware, paint, slate, granite, stone, etc. To increase the volume of construction means increased activity in all these industries and others that supply these industries. It means increased employment, increased sales, increased purchasing power and enlarged markets.

And among the groups the census takers should not overlook are the residents of drug store telephone booths.—*Judge.*

BUSINESS NOTE

"And now," said the teacher, "will someone please give us a sentence using the word 'candor'?"

"Please, 'm," said the bright little boy in the front seat, "my papa had a pretty stenographer, but after na saw her he candor."

Big Volume of
Work Is
Under Way

Projects
Completed
and Accepted

State Highway Work During May

C. H. PURCELL, State Highway Engineer,
Chief of Division

Many Highway
Improvements
Made Possible
Through Work
Now Undertaken

The following report summarizes progress in state highway work during the month of May:

Work placed under contract.....	\$823,900
Contracts pending and advertised.....	2,564,700
Work in progress, anticipated to be advertised during the coming month.....	3,702,400
Total.....	\$7,091,000

WORK COMPLETED, ACCEPTED

During this period among the contracts which have been completed and accepted are the following:

BARSTOW OVERHEAD

The overhead grade separation over the tracks of the Santa Fe Railroad at Barstow, in San Bernardino County, is now an accomplished fact. This large structure spans the yards of the railroad and consists of three 172½-foot steel truss spans, two 65-foot deck girder spans, one 76-foot deck plate girder span, one 40-foot steel beam span and approximately 392 feet of timber trestle, making the total length of the overhead 1155 feet. This improvement fills a long-felt need in this vicinity and serves a threefold purpose, as it is on a section of the state highway which is common to the road from Los Angeles and San Bernardino to southern Nevada, the route from Mojave to Barstow, and the road toward Needles and Arizona. The cost of the structure was \$163,200.

CAJON BRIDGE

Another structure to be completed in San Bernardino County is the 60-foot reinforced concrete slab bridge near Cajon station on the Cajon Pass road. This bridge was constructed at a cost of \$18,500 and eliminates a big dip in the highway. It has a clear roadway width of 34 feet.

MOJAVE TO OWENS VALLEY

The 14 miles between Freeman and the northerly boundary of Kern County have been graded to a width of 36 feet and surfaced with oil-treated crushed rock. This work was on a portion of the highway from Mojave to the Owens Valley or the easterly side of the Sierras. It is a link in the improvement of this arm of the state highway system upon which traffic is rapidly increasing. The road not only serves those living in the Owens Valley, but each year carries more and more recreational traffic from southern California to the mountains in the summer and to the desert in the winter. By the end of this year there will be approximately 200 miles of continuous and modern surfaced highway on this route. The cost of this project amounted to \$147,900.

WIDENING VALLEY ROUTE

The general program of widening the main Valley Route between Los Angeles and Sacramento has received impetus by the reconstruction of over twelve miles of this road between the southerly boundary of Tulare County and Pixley. This improvement has given a 36-foot roadway, and an asphalt concrete pavement 20 feet wide has been placed, using the old 15-foot Portland cement concrete as a base. The cost was \$316,500.

FEATHER RIVER LATERAL

At a cost of \$184,000, the first link of the all-year Oroville to Quincy highway along the North Fork of the Feather River has been completed. The project covered the four miles in Butte County between Oroville and the Feather River, where the road will cross both the Western Pacific tracks and the river on the beautiful reinforced concrete open spandrel arch bridge which is now under construction. At present motor travel to the city of Quincy and much of Plumas County is cut off for five or six months each year due to the heavy snowfall in the passes, and the completion of this new route will give to that locality an all-year highway.

BRIDGE LANDMARK REPLACED

The passing of one of California's landmarks is seen by the replacing of the old suspension bridge across the North Fork of the American River near Auburn. The old bridge connecting Placer and El Dorado counties at this point was erected in the early sixties and was next to the oldest bridge in the state highway system. It was in very poor condition and has been replaced by a 322-foot steel suspension span, having a 12-foot roadway width. The selection of this type of bridge was governed by the fact that the permanent location of this river crossing is dependent upon the building of a dam below the present site and that the loss will be held to a minimum when the permanent structure is erected. The bridge was erected at a cost of \$27,800 and is located near the northerly end of the interesting Mother Lode Highway.

COTTONWOOD BRIDGE

Another old and dilapidated bridge has gone the way of all faithful servitors of public convenience, and the worst portion of the Pacific Highway between Sacramento and Redding is eliminated. This improvement is the construction of a bridge, consisting of twenty 60-foot reinforced concrete girder spans on concrete piers and pile foundation, across Cottonwood Creek between Tehama and Shasta counties. The new bridge is constructed on an improved alignment, the roadway portion of which has just been advertised for bids in connection with the construction of a new reinforced concrete subway under the tracks of the

Southern Pacific Railroad in the town of Cottonwood. The bridge was built at a cost of \$167,800, and the subway and the Portland cement concrete pavement are estimated to cost \$163,500.

BID OPENINGS

Some of the more important projects for which bids were opened during the past four weeks include:

APPROACHES TO VICTORVILLE BRIDGE

A project for the construction of the roadway approaches to the new bridge, upon which construction is just starting, across the Mojave River near Victorville in San Bernardino County. This work, which will cost \$19,800, comprises 0.8 of a mile of 36-foot graded roadbed on an improved alignment of the state highway from San Bernardino to Barstow. The present bridge was constructed by the county some twenty years ago and was placed on an inferior standard of alignment. The new structure with its approaches will give a river crossing of modern standards of alignment and grade.

MOKELUMNE RIVER BRIDGE

In San Joaquin County an important improvement is to be made on the Los Angeles to Sacramento artery on that portion of this important route between Stockton and Sacramento, where it crosses the Mokelumne River at Lodi. A 162-foot reinforced concrete girder bridge with 665 feet of timber trestle approaches, together with three-quarters of a mile of roadway approach, is to be constructed as a crossing over the Mokelumne River. The bridge will replace the existing steel truss bridge with its timber approaches which was erected by the county in 1898, and will have a clear roadway width of 34 feet. The roadway approaches will be graded 36 to 40 feet wide and be surfaced with untreated crushed gravel or stone. They will be the first stage in the construction of a Portland cement concrete pavement on this section of the road. The present construction of the high fills necessary to the bridge approaches will allow ample time for settling before the placing of the pavement during the next biennium. The total cost of this improvement will be \$112,200.

TABOE-UKIAH SECTION

A new alignment of a portion of the Taboe-Ukiah lateral will be made on approximately 13 miles of this route between Bear Creek and five miles west of Williams in Colusa County, to be constructed at a cost of \$152,700. This project will replace with wide curves and easy grades the existing steep and crooked unimproved dirt road, from the mountains near Clear Lake to the Sacramento Valley. Its construction will mark a new link in the building of another improved highway across the state from the Sierras to the sea.

PACIFIC HIGHWAY

Another project just being started in Colusa County is the construction of a 39-foot graded roadbed between Williams and Maxwell, at a cost of \$67,900. This 8.3 miles is a portion of the West Side Road and is the first stage of the ultimate improvement of this section of the Pacific Highway. The roadbed is to be constructed to the west of the existing pavement so that the center line of the ultimate pavement will coincide with the center line of the recently acquired 100-foot right of way. The placing of a gravel base for the new pavement will be done later in the sum-

mer and paving will be laid during the next biennium. Particular care has been taken on the present project to secure adequate drainage, as the road passes through irrigated rice fields.

REDWOOD HIGHWAY PROJECT

At Scotia and from Fortuna to Loleta in Humboldt County a 20-foot Portland cement concrete pavement is to be placed on $4\frac{1}{2}$ miles of the scenic Redwood Highway. This work will increase the Portland cement concrete in Humboldt County on this route to some 33 miles. The grade and alignment of these two portions are excellent. Their cost will be \$164,250. Adjoining this improvement on the north, 2.5 miles of screened gravel surfacing, 22 feet wide, is to be placed on the recently constructed graded roadbed, and the 2.7 miles north of this improvement is to be graded and similarly surfaced to a new and modern gradient and alignment. This 5.2 miles of Redwood Highway improvement will cost \$56,500.

WORK ADVERTISED

Work advertised for bids during the past month includes the following projects:

FOOTHILL BOULEVARD

Widening of the roadbed to 56 feet and placing an asphalt concrete pavement 30 feet wide on the Foothill Boulevard from Azusa to Glendora in Los Angeles County. This project is in line with the general improvement of this heavily traveled road from Los Angeles to San Bernardino. This construction will give a three-lane pavement with wide shoulders over this mile of highway.

CUYAMA LATERAL

In Santa Barbara and San Luis Obispo counties, the Cuyama lateral is to be graded and surfaced with oil-treated crushed gravel or stone for a distance of 26 miles. The work will extend from the third crossing of the Cuyama River to the Kern County line, and proposes to straighten several curves and iron out the wrinkles of the present choppy gradient. The Cuyama lateral connects the San Joaquin Valley with the Coast Route at Santa Maria; it serves as an outlet for the Maricopa oil fields to the coast as well as connecting the valley artery with Route 2.

COAST ROUTE IMPROVEMENT

An important improvement to the Coast Route, between Los Angeles and San Francisco, is noted by the advertising for bids on the construction of a new bridge across the Salinas River at Bradley in Monterey County, about 21 miles north of Paso Robles. The present structure, which was built by the county in 1888, is in very poor condition, dangerously narrow, and is approached by two vicious curves. The new structure will be built on a new and sane alignment; it will consist of six 140-deck truss spans, with a concrete deck, resting on concrete piers, placed on pile foundations, and 810 feet of reinforced concrete girder spans on concrete bents placed on pile foundations. The clear roadway width will be 24 feet.

WORK SOUTH OF PALO ALTO

Another portion of the important Coast Route which runs from Los Angeles to San Francisco is to be reconstructed just to the south of Palo Alto. From San Antonio avenue in Palo Alto to Sunnyvale, five miles of the part of this road extending down the

peninsula from San Francisco is to be widened to a 50-foot roadbed and paved with asphalt concrete, over the existing 20-foot pavement, widened with Portland cement concrete to a minimum width of 30 feet. The paving of this portion of this heavily traveled highway will fill the last gap in the reconstruction of this route from Palo Alto to Santa Clara.

BIG BASIN PROJECT

In Santa Cruz County, Route 42, which traverses Big Basin, one of the state's most attractive recreational spots and known as "California Redwood Park," is to be graded and surfaced with water-bound macadam, with bituminous surface treatment 20 feet wide, for a stretch of over 2½ miles between Waterman Switchback and Saratoga Gap. The recently completed construction on the Skyline Boulevard and its lateral connections makes this Redwood forest accessible to one and one-quarter million people with less than three hours driving over roads of unusual scenic attractions.

SAUSALITO TO SAN RAFAEL

Another advertisement calls for bids on a bituminous macadam pavement 30 feet wide on the 4½ miles of the graded roadbed just being completed on a portion of the new alignment of the Redwood Highway between Sausalito and San Rafael. This work adds another link to the steady improvement of this scenic and popular highway. The new road will be nearly level and considerably shorter than the existing route.

WORK EAST OF TRACY

Reconstruction on two miles of the Santa Cruz to Stockton lateral has been advertised. The portion to be improved is located just east of Tracy from the South Banta road to the East Banta road, and is a link in the heavily traveled routes from San Jose to Stockton and from Oakland to Stockton. The work consists of widening the present 20-foot roadbed to 36 feet and placing an asphalt concrete pavement 20 feet wide over the existing narrow 15-foot Portland cement concrete pavement.

MOTHER LODGE IMPROVEMENT

The replacing of the existing old and rattling light steel bridge with its serpentine approaches, which carries the Mother Lodge Highway across the Cosumnes River from El Dorado County to Amador County, is estimated to cost \$32,700. The old structure was erected by the counties in 1895 and will be replaced by a timber bridge 291 feet long and located on a straightened alignment at this crossing.

SNOW LIFTING ENABLES WORK TO PROCEED

With the lifting of the snow from the Sierras comes a series of important improvements on the transcontinental highway which crosses the summit between Sacramento and Reno. This highway, while closed in the mountains for five or six months a year, carries a large tourist travel into the state each year and is also used by thousands of vacationists seeking recreation at Lake Tahoe and other points in the high Sierras. The work on this road advertised this period consists of:

Surfacing with crusher run base and untreated crushed gravel or stone, 22 feet wide, 10.8 miles from the South Fork of the Yuba River to Soda Springs in Nevada and Placer counties. This surfacing is being placed on the roadbed constructed on a new alignment last season.

YUBA RIVER BRIDGE

At the westerly end of the surfacing a bridge 100 feet long and consisting of two reinforced concrete girder spans is to be constructed across the South Fork of the Yuba River.

DANGEROUS GRADE CROSSING ELIMINATED

The construction of an overhead grade separation over the tracks of the Southern Pacific Railroad on the new alignment of this road at Yuba Pass in Nevada County will eliminate the use of the present dangerous grade crossing at Crystal Lake. While there have been only a few fatal accidents at the existing crossing, it is potentially one of the most dangerous blind crossings in California. The steep and tortuous mountain road makes an "S" curve across the double tracks of the railroad between a 100-foot opening in the snowsheds. During the summer months, when the highway is open to travel, 83 trains pass over this crossing daily, so it can easily be seen that the new grade separation will be a safety factor greatly appreciated by the traveling public using this road.

EMIGRANT GAP

Another grade separation on this route is to be an underpass consisting of a steel girder span on concrete abutments at Emigrant Gap in Placer County. The structure will be built on the site of the existing grade crossing, which likewise crosses the railroad between two right-angle turns.

GRADING ON FEATHER LATERAL

A short portion of two miles of heavy grading is to done on the new routing of the Oroville to Quincy lateral from Bardees Creek to the proposed bridge across the Feather River at Pulga in Butte County.

REDDING-ALTURAS LATERAL

In Shasta and Lassen counties 18 miles of the Redding-Alturas lateral is to be graded to 24 feet and surfaced with untreated crushed gravel or stone. This section extends from Fall River Mills to Big Valley and is located on an entirely new alignment. The new road will supplant the existing county road, which largely follows the section lines with the many attendant right-angle turns, and is of varying widths and has a badly broken gradient. The present alignment is located on an excellent alignment of large radius curves, long tangents, and easy grades.

ACCEPTANCE OF HIGHWAY CON-TRACTS DURING MAY

PACIFIC HIGHWAY

TEHAMA AND SHASTA COUNTIES—Contract for the construction of a bridge across Cottonwood Creek at an approximate cost of \$159,000 has been satisfactorily completed and accepted. Bodenhamer Const. Co. of San Diego was the contractor.

PLACER AND YUBA COUNTIES—Surfacing with bituminous and widening with oil treated gravel between Roseville and Andora Subway in Placer County, and in Yuba County between Dry Creek and Morrison's Crossing, 2.9 miles, at an approximate cost of \$18,600. J. E. Johnston of Stockton was the contractor.

REDWOOD HIGHWAY

MENDOCINO COUNTY—Contract for surfacing with untreated crushed gravel or stone between two

miles south of Arnold and the Sherwood-Laytonville road, about 8.7 miles, at an approximate cost of \$46,300, satisfactorily completed, etc. Hemstreet & Bell of Marysville, contractors.

HUMBOLDT COUNTY—Contract for surfacing with untreated gravel or stone between Dean Creek and Fish Creek, for about 7.3 miles, at an approximate cost of \$35,300, has been completed and accepted. Engelhart Paving and Construction Co. of Eureka, contractors.

MOTHER LODE HIGHWAY

TUOLUMNE COUNTY—Contract for placing screened gravel surfacing between one mile northwest of Shaw's Flat and the Columbia-Sonora road, for about 1.6 miles, at an approximate cost of \$6,300, satisfactorily completed, etc. Adams Company of Angels Camp, contractors.

PLACER AND EL DORADO COUNTIES—Contract for the construction of a suspension bridge across the North Fork of the American River near Auburn, at an approximate cost of \$26,500, satisfactorily accepted. Smith Bros. of Eureka, contractors.

TAHOE-UKIAH HIGHWAY

LAKE COUNTY—Contract for furnishing and applying fuel oil between Middletown and the Old Williams Road, for about 23 miles, at an approximate cost of \$6,100, satisfactorily accepted. Basalt Rock Company of Napa, contractor.

HAYWARD-NILES LATERAL

ALAMEDA COUNTY—Contract for constructing a graded roadbed and placing Portland cement and asphaltic concrete between Hayward and Niles, for about 8.7 miles, at an approximate cost of \$350,200, has been satisfactorily completed in accordance with the plans and specifications. Hanrahan Company of San Francisco, contractor.

VALLEY ROUTE

MADERA COUNTY—Contract for constructing a bridge across Cottonwood Creek, at an approximate cost of \$30,400, has been satisfactorily completed, etc. Geo. G. Wood of Fresno, contractor.

COAST ROUTE

VENTURA COUNTY—Contract for constructing oil-treated crushed rock borders from 3.8 miles east of Camarillo to Camarillo, 3.8 miles distance, at an approximate cost of \$12,000, satisfactorily completed. Southwest Paving Company of Los Angeles, contractor.

CHOLAME PASS LATERAL

KERN COUNTY—Contract for constructing a graded roadbed and placing a bituminous macadam surfacing between 5 miles and 7 miles east of Lost Hills, on the Cholame Pass route, distance of about 2 miles, at an approximate cost of \$44,100, satisfactorily completed and accepted. Hartman Construction Company, Bakersfield, contractor.

LOS ANGELES-OWENS VALLEY-BISHOP LATERAL

KERN COUNTY—Contract for constructing a graded roadbed and placing oil-treated crushed gravel or stone surfacing between Freeman and the northerly county boundary, and covering a distance of 13.9 miles, at an approximate cost of \$143,700, has been

satisfactorily completed, etc. Bartlett & Mathews of Pasadena, contractor.

CLAREMONT-RIVERSIDE LATERAL

RIVERSIDE COUNTY—Contract for constructing a graded roadbed and placing a Portland cement concrete pavement at the Wineville Subway, for about 0.5 of a mile, at an approximate cost of \$44,500, has been satisfactorily completed and accepted. Matich Brothers of Elsinore, contractor.

DIVISION OF ARCHITECTURE REPORTS

GEORGE B. McDOUGALL, Chief

In line with the administration's determination that the state shall use every available means to relieve present unemployment conditions, the Division of Architecture is urgently pushing forward its program of work so as to get all authorized building construction projects under way in the field at the earliest possible time.

Contracts awarded during May were on projects at the following state institutions: Pacific Colony; Patton State Hospital; Agricultural Park, Sacramento; Whittier State School.

ARCHITECTURAL AWARDS For Month of May

PACIFIC COLONY, Spadra. Contract for construction of Assistant Physician's Cottage, awarded to A. R. McMurray of Los Angeles for \$5,530.

PATTON STATE HOSPITAL, Patton. Contract for construction of Assistant Physician's Cottage, awarded to A. R. McMurray of Los Angeles for \$6,150.

STATE FAIR GROUNDS, Sacramento. Contract for general work on Restaurant Building, awarded to Guth & Fox of Sacramento for \$18,626.

Contract for plumbing and ventilating work on above building awarded to Latourrette-Fical Company of Sacramento for \$1,853.

Contract for electrical work on the above building, also awarded to Latourrette-Fical Company for \$1,132.

WHITTIER STATE SCHOOL, Whittier. Contract for general work on Ward Building and Shop Building, awarded to H. E. Kerr & Son of Los Angeles for \$46,190.

Contract for electrical work on the above buildings awarded to the American Electric Construction Company, Los Angeles, for \$2,575.

Contract for plumbing and heating work on above buildings awarded to Pacific Pipe and Supply Company of Los Angeles for \$11,218.

HIGHWAY MAINTENANCE STATION BUILDINGS in District VII, southern California. Contract awarded to A. R. McMurray of Los Angeles for construction of several groups of buildings at three maintenance stations for \$31,000.

STOCKTON STATE HOSPITAL. George M. Clark of Stockton awarded contract for drilling and testing water well at the Stockton State Hospital Farm for \$5,400.

Hoover-Young
Water Board
Meeting.



Progress Report
of Water Study
Investigations

Review of May Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Adjudication of
Water Rights



Irrigation and
Water Storage
Districts

WATER RESOURCES INVESTIGATIONS

MOJAVE RIVER INVESTIGATION

Levels were run to obtain elevation at wells in the lower part of the valley and measurements of depths to ground water were begun. The river ceased to flow in quantities sufficient to cross the percolating area of the upper basin during the month.

SANTA ANA INVESTIGATION

Field work has begun looking toward determination of what should be done toward conservation and flood control at Cucamonga, San Antonio, Day, Deer and Lytle Creeks. The field work on rainfall penetration was continued throughout the month in the regular way as was also the work on evaporation from seeped areas.

LOS ANGELES BASIN

A report was prepared at the request of the Conservation Association of Los Angeles County setting forth lines of research and investigation which should be conducted in Los Angeles Basin to permit conclusions as to the best method of utilizing local and imported waters.

NAPA COUNTY INVESTIGATION

In addition to the maintenance of the regular gaging stations on Napa River and Conn Creek several series of measurements were made on each stream at intermediate points in an effort to establish the location and extent of rising water and percolation losses.

SANTA CLARA INVESTIGATION

A base map is in course of preparation upon which to show well locations, gaging stations, underground water contours, etc. In the field, information was obtained with which to spot the wells which are being measured, and records of earlier surveys with respect to these wells were obtained. Some progress was also made in the computations of stream flow and percolation rates.

SAN JOAQUIN VALLEY INVESTIGATION

Ground Water Investigation: A geological study of potential underground reservoirs initiated last month has been completed and report rendered thereon. Maps have been prepared delineating the ground water elevations in Kern County for each year for the period 1924 to 1929. Similar maps are in preparation for Tulare, Kings, Fresno and Madera counties. These maps will be used to estimate the volumetric changes in the underground water supplies for the past several years and also for determining the under-

ground storage available in working out a plan for the maximum utilization of the water resources of the southern San Joaquin Valley in conjunction with the plan for importation of a supplementary supply from the Sacramento River Basin. A survey is now under way to determine the location, extent and capacity of these underground reservoirs as well as to determine the rate at which water can be introduced into them.

Main Supply Canals: The location survey of a canal which would divert from the San Joaquin River at elevation approximately 470 feet has been completed from that river to the Kings River. This canal would permit water to be diverted from the San Joaquin River by gravity to the Kern River without exchange of supplies at the Kings River. Office studies, preliminary designs and cost estimates have been made of several plans of exporting water from the Sacramento River Basin to the San Joaquin River Basin, namely:

1. A gravity route extending from the main streams in the Sacramento River Basin to the Kern River.
2. A gravity canal from the American River to Mendota on the San Joaquin River in conjunction with an exchange gravity canal extending from the San Joaquin River, elevation 470 feet, to the Kern River.
3. A dam and pump system up the main channel of the San Joaquin River to Mendota in conjunction with the gravity exchange canal under Item 2.
4. A pump and canal system paralleling the San Joaquin River on the west side from tide level to Mendota in conjunction with gravity exchange canal under Item 2.
5. A pump and canal system from tide level by the most direct route to the base of the hills, elevation 200 feet, and a gravity canal, thence to Mendota in conjunction with gravity exchange canal under Item 2.

With these studies as a basis the most economic plan will be selected for the importation of water from the Sacramento River Basin to the San Joaquin River Basin.

Geological Investigations: Geological examinations have been made and reports rendered on the Temperance Flat and Friant Dam sites on the San Joaquin River, Pine Flat Dam site on the Kings River, Ward Dam site on the Kaweah River and Pleasant Valley Dam site on the Tule River. Field examinations have been made also on the Bakersfield Dam site and Isabella Dam site on the Kern River.

SACRAMENTO VALLEY INVESTIGATION

Land Classification: A field classification has been completed on 8,750,000 acres, 750,000 acres being covered since the last report. Summaries have been completed of these lands by classes and the crops raised thereon for the year 1929. The areas of the irrigated lands for the years 1927 and 1929 have been compiled.

segregated by counties and also by source of water supply.

Surveys: Surveys of the Upper Narrows Dam site on the Upper Yuba River and an extension of the surveys on the Coloma Dam site have been completed.

SALINITY INVESTIGATIONS

The work on the salinity investigations has been directed toward the preparation of plates which delineate the history of the incursion of salinity into the upper bay and delta regions as well as to the relationship of stream flow into the delta and tidal action to the incursion of salinity. These graphs are based on analytical studies which have been made, utilizing the data that have been collected during the past ten years.

SALT WATER BARRIER INVESTIGATION

The survey of the industries and public water supplies has been continued through the past month, and at this time it is 75 per cent completed. Surveys of agricultural and reclamation developments within the delta area on the Sacramento and San Joaquin rivers are also completed.

Cooperative work arranged by this office with the state and federal agencies has been in active progress. The State Bureau of Sanitation of the Department of Public Health has been actively engaged in a field and office study of sewage pollution and industrial waste as related to the proposed salt water barrier. The Division of Highways is engaged in a very extensive study of the possibilities of utilizing the salt water barrier for a highway crossing over the bay at the several proposed sites. Additional geological studies of all the proposed sites for the barrier and surrounding areas have been started by Professor C. F. Tolman, consulting geologist. The geological examinations and reports are to be completed by the middle of July.

HOOVER-YOUNG COMMISSION

The sixth meeting of the Joint Legislative Water Committee and Hoover-Young Commission convened at Hotel Oakland, Oakland, May 7, 1930, with an excellent attendance by members of both the committee and commission. There were present, in addition, numerous interested public parties.

A. M. Barton, engineer of the American River Flood Control District, appeared and described the relationship between the proposed American River Flood Control Project and the contemplated Folsom Dam. An aerial survey map was used in presentation.

Edward Hyatt, State Engineer, explained the possibilities of a combined system embracing the Auburn, Coloma and Folsom reservoirs on the American River and gave the comparative investments in the American River system with the Kennett Dam.

F. I. Green and Dr. J. L. Rollins presented briefs and oral discussions of their respective projects on the American and Bear Rivers.

In the afternoon, under the direction of Mr. H. S. Gilman, president of the Angeles Forest Protective Association, there appeared eight professional engineers and government authorities speaking in behalf of the "Influence of California Forests and Water Conservation." This proved a subject of particular moment for consideration by the committee and commission.

IRRIGATION AND WATER STORAGE DISTRICTS

The El Dorado Irrigation District was visited in connection with the proposal of the district to increase its water supply by additional storage.

On April 26 the State Engineer rendered a report to the Board of Supervisors of Butte County approving an election on the organization of the Richvale Irrigation District, subject to the authorization of the board on final hearing of petition. The Richvale District contains about 18,000 acres in southern Butte County and obtains its present irrigation supply from the Sutter-Butte Canal Company.

On May 5, under authority vested him by the Water Storage District Act, the State Engineer issued an order excluding certain lands which had been petitioned for exclusion from the Tulare Lake Basin Water Storage District.

REQUESTS APPROVED

The following requests by various districts were approved by the California Bond Certification Commission upon recommendation of the State Engineer:

Rescission of a previous order by the commission approving expenditures requested in the amount of \$14,805, and the approval of a new order for expenditures by the El Dorado Irrigation District in the amount of \$11,345 for development of the project.

The West Stanislaus Irrigation District was authorized to sell at private sale \$50,000 par value of their bonds at 93 per cent.

The Banta-Carbona Irrigation District was granted approval of an expenditure for development of the project for \$5,760 and authorized to sell at private sale \$6,000 par value of bonds of the district at 96 per cent.

FINANCING STUDIES

On May 16 the commission appointed by Governor Young to investigate and study the financing and refinancing of irrigation and reclamation districts in California, of which the State Engineer is a member, met at the office of the Superintendent of Banks in San Francisco and effected a preliminary organization preparatory to holding hearings and proceeding with their inquiries.

There have been several meetings held during the past month in connection with the distribution of the waters of Kings River. The State Engineer has been appointed as referee in the matter of the distribution of water in the Kings River, which is a problem of major importance in the area affected, and has now under consideration a schedule providing for the administration of this stream when the water is at certain stages. Another meeting on this subject is to be held in the near future at which it is expected that a decision agreeable to all parties in interest may be arrived at.

CELEBRATE COMPLETION OF WORK

On April 26 the West Stanislaus Irrigation District celebrated the completion of its irrigation system. This district includes 21,000 acres lying on the west side of the San Joaquin River in Stanislaus County. The event was marked by a very interesting program consisting of historical pageantry, music and speeches. Through the pageant was traced the progress of development of the west side from the various stages of range lands and dry farming to the present era of intensive irrigated agriculture. Introductory talks

were made by President Cox of the district and Senator Bennett, attorney for the district, followed by Governor Young, Attorney General Webb and Bank Superintendent Wood, congratulating the district upon the successful culmination of its efforts. The Division of Water Resources was represented by Mr. Hyatt, State Engineer, and A. N. Burch and E. N. Bryan, assistants. The setting for the fete was a beautiful grove of oaks on the banks of the San Joaquin River, near the intake works of the district.

By invitation, on the evening of May 6 State Engineer Hyatt and his assistant, Mr. Burch, attended a meeting of land owners of the Woodbridge Irrigation District. The Woodbridge District, located in San Joaquin County, has an area of 13,000 acres, a large portion of which was highly developed before the district was organized. The district has just completed the rehabilitation of the old irrigation system which it took over from the Stockton and Mokelumne Canal Company. The officials of the district were holding "open house" in the newly built and equipped office in Woodbridge. Early in the evening a meeting of land-owners was held in the Woodbridge hall, at which the officials of the district gave a report on the progress of the work planned, with an explanation of costs and a statement of the financial condition of the district. It was shown that the construction program had been efficiently and economically carried out; that the district is financially sound, and its future prospects excellent. Mr. A. L. Cowell, attorney, spoke on the various phases of the water rights of the district. Other matters pertaining to the welfare of the district were discussed by district officials, the State Engineer and others.

Dam	County	Owner
Juneau	Sanja Barbara	Montealto County Water District
Silver Lake	Amador	Pacific Gas and Electric Company
Lower San Fernando	Los Angeles	City of Los Angeles
Burbank No. 5	Los Angeles	City of Burbank

OFFICE PROGRESS

Spillway discharge curves have been completed for practically all dams in the state. Maximum flood flows have been submitted by the Water Resources Investigations branch of the Division on the 95 dams in Modoc and Lassen counties. The spillways in these two counties have been analyzed on the basis of 1 in 100 years maximum flood. This study has lead to the conclusion that 34 of these spillways will need to be enlarged.

Methods and formulae for tabulating stresses in gravity dams have been prepared.

Curves and formulae for computing and tabulating stresses in arch and multiple arch dams have been made, and 38 arch and two multiple arch dams have been analyzed.

INSPECTIONS

An inspector and assistant have been assigned to Modoc and Lassen counties for the summer months. They are making a second and intensive inspection of the dams in this vicinity and will order all necessary work on spillways, outlets and repairing of slopes to make the dams safe.

All other dams in the state have been assigned to inspectors and by next fall the first inspection will have been completed for each dam.

FLOOD CONTROL AND RECLAMATION

DAMS

APPLICATIONS RECEIVED FOR APPROVAL OF DAMS BUILT PRIOR TO AUGUST 14, 1929

Twenty-four applications were received for approval of existing dams, bringing the total of such applications to 638. There remain about 50 dams for which applications have not been received. These lie mostly in the higher altitudes, where inspection is impossible at present.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR ENLARGEMENTS AND ALTERATIONS

Dam	County	Owner	Estimated cost
Mulholland	Los Angeles	City of Los Angeles	\$293,488

PLANS APPROVED

Dam	County	Owner	Estimated cost
Lake Madrone	Butte	George C. Mansfield and Duncan C. McCallum	\$20,000
Mary Joe	San Diego	H. F. Schnell	30,000
Mulholland	Los Angeles	City of Los Angeles	293,488

Application was made by the city of Los Angeles and approved by the State Engineer for the placing of an earthen embankment against the downstream face of the Mulholland Dam, as well as making provision for restricting the water level in the reservoir to approximately 35 feet lower than its present height. This is designed to increase the stability of the structure as well as improve its general appearance.

Orders Authorizing Use have been issued pending issuance of certificates of approval of the following dams:

Maintenance of Sacramento and San Joaquin Drainage District: Flood control project maintenance work during this period has been mostly routine, and consisted of repairs to structures, cutting weeds, making firebreaks and irrigating willows. No construction work is under way. Two dragline excavators have been engaged throughout the period in cleaning the canals of the drainage system.

Flood Control Project Maintenance, Bank Protection: Repairs have been completed to three current retards in the Sacramento River near Princeton in cooperation with Levee District No. 3. Bank protection work on the left bank of the Sacramento River opposite Rio Vista in cooperation with Brannan Island District No. 2067 has been completed at a cost of \$4,650. This consisted of quarry rock revetment. Call has been made for bids to be opened on June 5 for the construction of a sand fill and levee pavement at Isleton, to complete the work for which a bulkhead was driven a short time ago. This work is in cooperation with the Division of Highways. Work is under way on the construction of two current retards on the right bank of the Sacramento River near Princeton, in cooperation with Reclamation District No. 2047. The estimated cost is \$6,000.

Sacramento Flood Control Project: The work of clearing timber in the Sutter By-pass has continued with a force of approximately 80 men, 55 of whom are operating out of two camps, one of which was established about May 1st on our floating equipment in Sacramento Slough. A contract for clearing 100 acres in the lower Sutter By-pass has been completed. A number of reports on applications have been prepared for the Reclamation Board, and one meeting of the board was attended by the Deputy in Charge

of Flood Control and Reclamation. Also, the Deputy in Charge of Flood Control and Reclamation attended a meeting of the construction committee of the Flood Control Association, and accompanied the committee on the field examination of the levees in the lower Yolo By-pass. The five contracts for clearing timber in the Feather River overflow near Marysville are practically completed, except some portions of the area where work can not be resumed at present on account of the overflow water. Surveys of brush and timber areas have been made in the lower Sutter By-pass and in the Feather River near Marysville.

Russian River Jetty: Driving of piles and the construction of the timber portion of the jetty have continued throughout the period with a force of eleven men. The end of the structure is now approximately 80 feet beyond the shore line. The quarry and railroad have not been operated during this period.

Navarro River Jetty: Call has been made for bids, to be opened on June 5, for the construction of a rock jetty at the mouth of the Navarro River in Mendocino County. This jetty will be 190 feet long and contain 2000 yards of quarry rock. During the period from April 15 to May 15 an average of 131 employees have been engaged on the above work, exclusive of contractor's employees.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Compilations for the 1929 report are practically complete and the report is being stenciled for mimeographing. This is the usual annual report covering all diversions of water, stream flow measurements, results of return flow measurements, the salinity investigation, delta duty of water study, delta crop census, etc.

Field work was started the latter part of April with one engineer in charge on the river from Sacramento to Meridian, one from Meridian to Redding and a third covering the lower San Joaquin River, the Delta and the Feather, Yuba and American rivers.

All material for Bulletin No. 23 has now been submitted to the printer. This bulletin presents all data and records secured in the five-year period, 1924 to 1928, inclusive.

Continued field work on the salinity investigation has comprised the maintenance of regular observations at thirty-four delta stations.

A study and compilation of the Sacramento River riparian lands and use of water on them, both for normal and flood flow conditions, is nearing completion.

WATER RIGHTS

ACTION ON APPLICATION TO APPROPRIATE WATER

During the month of April, 50 applications to appropriate water were received, 31 were acted upon, 9 permits were revoked, and 6 licenses were issued.

PIT RIVER INVESTIGATION

Routine field work was continued throughout the month. Nineteen new gaging stations have been established for the purpose of obtaining more accurate data of the irrigation diversions and consumption during the current season. A meeting of the Permanent

Committee with representatives of the Division of Water Resources was held at Bieber on April 15th.

ADJUDICATIONS

Shasta River (Siskiyou County): The Long Bell Lumber Company's exception relative to water rights on Beanghan and Boles creeks, the only matter not yet submitted to the court, has been set for hearing in the Superior Court of Siskiyou County for June 13, 1930.

Whitewater River (San Bernardino and Riverside Counties): Still pending in the Superior Court of Riverside County awaiting developments in regard to the Proposed All American Canal from Colorado River.

North Cow Creek (Shasta County): Submission of referee's final report still being withheld pending negotiations now in progress towards settlement of one of the important issues.

Oak Run Creek (Shasta County): Case still pending in Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Cloror Creek (Shasta County): Case still pending in the Superior Court of Shasta County awaiting court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County): Case still pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County): Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County): A stipulation for consent judgment is being circulated among the parties who were not present at the water users' meeting held at Davis Creek on

Mill Creek (Modoc County): The trial schedule of distribution proposed by the Division of Water Resources is being administered by a water master during the current season.

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month. A plane table survey of the irrigated lands was commenced on May 6.

WATER DISTRIBUTION

Davis, Emerson, Mill, Oel and Soldier Creeks (Modoc County): Watermaster service on these streams was continued throughout the month.

Little Shasta River (Siskiyou County): Watermaster service on this stream was continued throughout the month.

Pit River (Modoc and Lassen Counties): Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River investigation.

Hat and Burney Creeks (Shasta County): Watermaster service was commenced on these streams for the 1930 season on May 1st, and involves the distribution of water to approximately 5000 acres of land.

NEW YORK—In Monroe County a traveling library, mounted on a specially constructed motor truck, loaned over 60,000 volumes last year. Over 1,000,000 people are to be served throughout the state by this service according to present plans.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

REGISTRATION COMPARISONS

A comparison of total registrations as of April 30, 1930, has been made against the total as of April 30, 1929. It is interesting to note that a gain has been made in every type of vehicle registered with the exception of solid tire truck equipment and in the number of transfers handled. The following table reflects the gain and loss as to classification:

	As of April 30, 1929	As of April 30, 1930	
Automobiles -----	1,675,832	1,776,444	100,612 gain
Pneumatic trucks --	52,502	69,588	17,086 gain
Solid trucks -----	19,021	14,136	4,885 loss
Motorcycles -----	7,332	7,428	96 gain
Trailers, pneumatic and solid -----	33,453	37,464	4,011 gain
Exempt autos -----	28,159	30,306	2,147 gain
Exempt motor- cycles -----	435	764	329 gain
Exempt trailers --	3,245	3,735	490 gain
Transfers -----	166,661	154,402	12,259 loss

On April 30, 1930, the division had issued 16,424 more chauffeurs' licenses than for the same period in 1929.

NONRESIDENT PERMITS

Records indicate that nonresident motorists have secured 5466 more permits up to April 30, 1930, than to April 30, 1929. On April 30, 1930, we had issued 16,131 nonresident permits.

On April 30, 1930, the division had collected \$8,539.316.77 in fees, which is \$297,263.08 less than for the same period in 1929. This loss in revenue is accounted for chiefly in the reduction in weight fee on commercial vehicles weighing between 3000 and 6000 pounds, which was reduced from \$15 in 1929 to \$8 in 1930. There is also a reduction in chauffeurs' fees from \$2 to \$1, and a change in the definition of a transfer.

BRAKE TESTING

During the month of April the California Highway Patrol inaugurated brake testing in several southern California cities. Between six and eight men worked on this detail with the assistance of local police. Within a period of four hours between 650 and 700 cars were checked.

An active program has been started in checking the conditions of the official headlight adjusting stations throughout the state. This work is being done in order to assure the public adequate service at these stations.

ENFORCEMENT PROGRAM

A campaign of enforcement during the summer months has been planned and a program has been worked out with officials of a number of the largest cities to include their cooperation with and independent of the California Highway Patrol.

During April, headlight enforcement drives were held in San Francisco, Oakland, Berkeley, Piedmont, Alameda, San Leandro and Hayward with very satis-

factory results. The police departments of these cities cooperated to the fullest extent.

HIGHWAY PATROL APPOINTMENTS For Month of May

The following officers have been appointed members of the California Highway Patrol in the following counties:

Santa Joaquin County—Milo L. Hewitt, Earl Foster, Emile E. Demitt, Jr.; George Ellis, Jr.

Kings County—Wm. L. Morton, Loren C. Rosenfeld.

Tulare County—L. H. Kober, Anstin W. Reynolds.

San Mateo County—Manfred J. H. Walzberg.

Stanislaus County—Chas. A. Brink.

Solano County—Coy F. Long, C. Elmer King.

Tehama County—John B. Shaffer, Edward W. Washburn, Paul R. Hobson, Donald M. Phillips, clerk.

Riverside County—Chas. D. Gandy, E. Gene Henderson, Jas. O. Linthicum, Ora E. Townsend.

San Diego County—Ralph B. Sutton.

Imperial County—Lewis Mitchell, J. Leroy Wells.

Kern County—Edgar J. Combs, Rex S. Hunter, Jas. C. Lane, Harold E. Nichols.

San Diego County—Herbert N. Coates, John V. Park, Joe Piper.

Orange County—H. E. Inge, John H. Turton, Chas. V. Wolfe.

Santa Barbara County—Fred T. Graves, Orville H. Ellis.

Ventura County—Dan Rentle, Jos. E. Waite, Raymond Mayhew.

San Bernardino County—Clyde D. Beach, Chas. D. Castle, Clifford L. Long.

Madera County—Wylmer W. Warner, L. D. Row.

Sonoma County—Irving H. Rohner, Geo. N. Nardi.

FOR THE WANT OF A HORSESHOE NAIL

For the want of a nail, the shoe was lost;
For the want of a shoe, the horse was lost;
For the want of a horse, the rider was lost;
All for the want of a horseshoe nail.

To which Herman Jerrett, right of way agent of District III, adds the following stanza, dedicating it to state highway engineers in general:

For the want of a tie, the line was lost;
For the want of a line, the land was lost;
For the want of the land, the ownership was lost;
All for the want of a proper tie.

Officers of the California Highway Patrol are expected to look smart and snappy, but not to swelter in heavyweight uniforms during summer weather. So much is indicated in a bulletin issued by Eugene W. Biscailuz, superintendent of the patrol, instructing officers that they may appear in lightweight uniforms during the coming summer season if they desire. Coats, breeches and caps must be of the same material and colors as the regulation uniform, except lighter in weight.

MAKING OUR HIGHWAYS SMOOTH

(Continued from page 2.)

throws both counters in or out of gear as desired.

In order to standardize the instrument the car is run over a short stretch of pavement and the units of roughness between two marked points are noted. A set of five boards is then laid across this same stretch at regular intervals, each set of boards being 10 inches wide and exactly one inch thick. The car is driven over the boards and the units of roughness between the marked points again noted. The additional units of roughness caused by driving the car over the five boards are then considered as being equal to 10 inches of roughness. With the calibration factor secured in this way the car is driven over any piece of road to be measured and the "inches of roughness per mile" figured from the units of roughness indicated for each mile by the counter on the roughometer. Since the instrument measures the travel of the springs only in compression, the calibration test records the spring compression when the car hits a board and again when it drops off. Different makes of cars and different cars of the same make will give entirely different results in units on the roughometer counter when driven over the same road. The use of the boards furnishes a correction factor for the dial readings so that results secured by different cars are standardized to a common basis and comparable results secured.

Since so many factors enter into the spring action of a car it has been found advisable to make a calibration run each time that the roughness of any section is to be measured. To operate the instrument properly it is of course necessary that the front snubbers be detached. Experience has shown that uniform results will be difficult to get until after a car has been run about 10,000 miles to get the stiffness out of the springs, and all spring connections must be thoroughly lubricated. Both in testing and making records the speed of the car is held as nearly as possible at 20 miles per hour. The inflation of tires is checked each time to a pressure of 50 pounds. On any given section of road, readings are taken at half-mile intervals on each side of the pavement and the average of the two sides used as the record for the job.

California now has two cars in the Construction Department equipped with roughometers, and readings are taken on all pav-

Dowell Bill Signing Is Commented Upon

State Highway Engineer C. H. Purcell is in receipt of the following letter:

AMERICAN ASSOCIATION
OF

STATE HIGHWAY OFFICIALS

In signing the Phipps-Dowell Bill President Hoover used two pens. These pens were presented by the American Association of State Highway Officials and the President, after signing the bill, gave one of the pens to Mr. L. C. Phipps, chairman of the Senate Committee on Post Offices and Post Roads and the other one to Mr. C. C. Dowell, chairman of the House Committee on Roads.

The ceremony in connection with the signing of the bill took place in the President's offices in the presence of all of the members of the Senate Committee and the House Committee having charge of this legislation.

There is a striking contrast in the fact that the first authorization of the Federal Government was \$5,000,000 in 1917 while the authorization in this bill carries \$125,000,000. This is also very substantial proof that the Federal Government is recognizing its increased responsibility in the construction of interstate highways.

Very sincerely,

W. C. MARKHAM,
Executive Secretary.

ing contracts as they are thrown open to traffic. At the end of the year a compilation of the figures for all state contracts is made and the results are published. In 1927 the average of all asphaltic concrete contracts was 22.1 inches per mile; in 1928 it was 14.7 inches per mile; and in 1929 it was 10.5 inches per mile. In 1927 the average of all portland cement pavements laid with joints at the end of every half day was 7.2 inches per mile; in 1928 with joints every 60 feet and dummy joints spaced 20 feet the average was 9.3 inches per mile; in 1929 with joints the same as in 1928 the average was 8.2 inches per mile. These results show the steady progress that has been made in getting smoother pavements each year. The smoothest asphaltic concrete pavement in 1929 was laid by the Peninsula Paving Co. of Redwood City on the section between Salinas and Chualar which tested 7.9 inches per mile. On the portland cement concrete work in 1929 the Griffith Co. of Los Angeles made the record of 4.4 inches per mile on their contract between Santa Ana and Anaheim.

By the use of these instruments the California engineers have been given a yardstick to measure the smoothness of the highways as they are built.

Civilizing Influence of Highways

By SAM TATE, Chairman Highway Board, State of Georgia

EDUCATORS have proven long ago that in the ultimate analysis education does not cost anything. It costs a great deal more for a state to remain in ignorance than it does to provide for the education of its citizens.

Ignorance, not intelligence, is the expensive thing. Precisely the same is true of good roads. There is a very real sense in which good roads do not cost anything. It is estimated that it costs 1 to 3 cents per mile more to travel over unpaved than on paved roads.

But after all, that is putting the matter at its lowest level; the cost of not having good roads will be a heavier toll in still other fields. It would be very instructive to have some one write for us the history of the influence of roads on civilization. Wherever nature has created or man has built a highway of travel, civilization has grown up along that highway.

The influence of great rivers on civilization has been tremendous. A river is a natural highway, and wherever nature has placed a highway, civilization has invariably followed. It was up the Mississippi Valley that civilization first pierced our own west.

The story of civilization begins with the story of a road. That is no accident. A road is a symbol of civilization.

Wherever there is a road it means that people have interests and dealings with others, and after all civilization itself is just a large group of people who have learned how to live with each other in a helpful and mutually profitable way.

It is the savage that lurks in the jungle; whenever a man ventures out of the jungle and joins with others in building a highway, however crude that highway may be, he has already learned the value of cooperation and has begun to ascend the scale of civilization.

Civilization and highways are always found together, and the one promotes the other. There is no road of which we have authentic information more ancient than the road that ran from Assyria to Egypt entering Palestine at Damascus and leaving it at Gaza.

Over this ancient route, even before the day of Moses, poured the stream of camel caravans that bore the wealth of Assyria to exchange it for the products of Egypt. It was to such a caravan that Joseph's brethren sold him and he was carried a slave into

Egypt over this ancient highway, which event not only shaped the destiny of Egypt but paved the way for the training, preservation and ultimate liberation of that race that has for centuries exercised such a mighty influence on the world.

No people have exerted an influence on civilization equal to that of ancient Israel.

A people can not live beside a road over which the commerce and culture of the world passes without feeling its force.

The Persian empire rose to its power and dominance because its kings were farsighted enough to see that no empire could be held together that did not build roads over which its soldiers and commerce could be quickly transported.

The ancient road from Susa to Sardis, 1500 miles long, was the backbone of the Persian empire, and it is but to recite a fact to say that the empire could not have existed without that great highway with its many branches.

It was nothing short of genius that gave young Rome the insight to build roads for her commerce and soldiery and to see to it that all these roads led to Rome.

Rome's first venture in road building was but the beginning of a system that finally reached from the highlands of Scotland across Europe to the frontiers of ancient Persia.

These roads went out from Rome like the spokes of a great wheel, and it is not even debatable that the Roman empire would have been impossible without this gigantic system of communication and transportation.

Over this great highway system sped not only soldiers and commerce, but ideas and customs. In short, the culture of one side of the empire came ultimately to belong to the other side, until the life of the empire was fused into a unity that would have been impossible without these roads.

From the time of the Caesars up until the nineteenth century, man did not essentially improve his method of communication. Through all these centuries the horse remained his swiftest means of travel.

One of the Roman emperors, by means of fresh relays of horses along his route, traveled a distance in one day that remained the world's record for speed until the day of our own grandfathers when the steam locomotive broke the record.

All thoughtful men know that civilization, material progress, and the higher values of life go hand in hand with the swiftness and certainty of the means of travel and communication.

It was no accident, therefore, but precisely what we would have expected, that the great burst of modern progress and material welfare should have come with the perfection of the steam locomotive. The beginning of our great wave of modern prosperity and material blessings goes back just about 100 years to the beginning of the great era of railroad construction in this country.

Whenever in history methods of communication and travel have been improved, there has invariably resulted an increase of man's material, intellectual and cultural wealth.

State Highway Progress Reports

ALAMEDA COUNTY

The Hanrahan Company, contractors on the construction of 8.7 miles of highway between Hayward and Niles, have fully completed their work.

The original roadway on this project had an effective width of about 34 feet, being an 18-foot width of 4½ inches Portland cement concrete with 8-foot earth shoulders on either side. The construction just completed provides a 50-foot roadbed width with 30-foot pavement throughout within a 100-foot right of way. The original pavement was utilized in so far as possible as a base for asphalt concrete surface, widening being effected by construction of the additional lane of Portland cement concrete 8 to 10 inches in thickness.

Three important line changes were made under the present construction, the most outstanding being that at the underpass of the Southern Pacific Railway at Niles, where an approach consisting of a 700-foot radius curve 150 feet in length, reversing on a 250-foot radius curve 180 feet long extending nearly through the structure, was replaced by a 500-foot radius curve 430 feet in length, making direct approach.

Right of way problems on this project were extremely complicated due to the heavy urban settlements along the highway with more than 200 owner-ships being involved. It was necessary to move and rehabilitate all residences and buildings on both sides for several blocks on the Hayward end of the job.

The construction cost of this project was approximately \$350,000, exclusive of right of way and rehabilitation of buildings.

COLUSA COUNTY

Construction of 13 miles of new state highway between Bear Creek and a point 5 miles west of Williams, on the Ukiah-Tahoe Highway, has been contracted for by Le Tourneau. The completion of this work will result in the abandonment of the present traveled way which is a tortuous narrow road between Abbott Mine and Freshwater Creek near the Williams end of the new project.

A 24-foot graded roadbed is planned from Bear Creek to the mouth of Salt Creek Canyon and from there to the junction with the present highway a 36-foot graded roadbed is planned. Completion of the work is estimated to be in April, 1931. Surfacing of this project is planned to begin some time prior to the middle of next year.

The work between Williams and Maxwell, consisting of construction of a 34-foot new grade alongside the present 15-foot concrete pavement, the details of which are noted in the April issue of THE JOURNAL, has been awarded to Fredericksen-Watson Construction Co. It is expected to complete the project this coming fall. No inconvenience will be experienced by the traveling public, who will have full use of the present pavement at all times while construction is under way.

DEL NORTE COUNTY

The Holdener Construction Company's contract for stockpiling crushed rock screenings over 35 miles of the Redwood Highway between Elk Valley and the Oregon line have engaged Smith Bros. to complete the work, and the material is now all in stockpile.

Smith Bros. have just been awarded a contract for furnishing and placing additional crushed rock surfacing at various locations along the Redwood Highway between Elk Valley and Patrick's Creek. It is expected that they will be ready to begin work within the next two weeks.

EL DORADO COUNTY

Construction of a new roadbed between Bay View Rest and one mile north of Eagle Falls is 30 per cent complete. Nate Lovelace, the contractor, has speeded up his progress during the past month and it is now expected that the work will be completed in December of this year, the scheduled time of completion.

GLENN COUNTY

The concrete paving project between Logandale and Willows, the details of which were noted in the April issue of THE JOURNAL, has been contracted for by Basich Bros. Construction Co., Inc., and is expected to be under way by the middle of May. The work, which is scheduled for completion before the end of the current year, will not inconvenience public traffic, which will use the old pavement alongside during construction of the new pavement and the west shoulders and will then have the use of the new pavement.

HUMBOLDT COUNTY

The work of producing and stock piling bituminous macadam rock along the Redwood Highway for a 20-foot by 2-inch bituminous macadam pavement between a point one mile south of Orick and the northerly Humboldt County line is now more than half complete, and the contractor, Heafey-Moore Company, who have the contract for placing the bituminous macadam, have started setting side forms and expect to start the laying of the macadam rock within another two weeks.

Heafey-Moore Company will also probably complete this week the placing of a 2-inch by 20-foot bituminous macadam pavement on the 10.7 miles between Arcata and Little River.

The Englehart Paving and Construction Company have been awarded the contract for grading and surfacing a new connection between the Arcata-Blue Lake road and the Redwood Highway at a point approximately one mile north of Arcata. The contract

involves grading and surfacing in the amount of approximately \$10,000.

Mercer-Fraser Company, who have the contract for the construction of the new Trinity River bridge near Willow Creek, now have a portion of the steel on hand and expect to begin erection in the near future.

Bids were received on May 21 for furnishing and placing crushed rock surfacing over the newly graded roadway between Loleta and Beatrice station and for extending the grading and placing of surfacing on an additional 1.8 mile of roadway at the northerly end of the same project.

Contractor J. B. Galbraith of Petaluma has just been awarded the contract for the construction of a concrete pavement between Fortuna and Loleta. It is expected that he will begin work within the next two weeks.

The E. C. Coats contract for grading and surfacing a 28-foot standard roadway on that portion of the Redwood Highway between Fish Creek and Stephens Grove in the vicinity of Miranda is more than 60 per cent complete, and it is to be expected that there will be very little interference with traffic during the touring season.

The Engelhart Paving and Construction Company has completed the producing and placing of crushed rock surfacing on approximately 7.3 miles of the Redwood Highway between Dean Creek and Fish Creek, approximately 6 miles south of Miranda.

H. H. Boomer, who has a contract for grading and surfacing a portion of the state highway, approximately 1.2 miles in length immediately north of Garberville, is approximately 40 per cent complete, and it is expected that his operations will not interfere with traffic during the summer.

Chigris and Sutsons were awarded the contract for grading and surfacing 1.4 miles of the Redwood Highway between the southerly Humboldt County line and Richardson Grove. They began work about March 25 and are now approximately 25 per cent complete.

LAKE COUNTY

State forces will commence by the middle of May to oil treat 10.6 miles of 20 feet wide crushed stone surfacing recently placed, by contract, on a new graded highway between Lucerne and Clear Lake Oaks. The work, it is estimated, will require two months to complete.

Widening of the roadbed to 24 feet between Sweet Hollow Summit and Abbott Mine is 95 per cent complete. Another month will see the completion of this work.

From Abbott Mine to Bear Creek, Colusa County, the construction of a new 24-foot graded roadbed is being carried on with sufficient force and equipment to insure the completion concurrently with or prior to the completion of the graded highway to the east now under contract for construction.

The Basalt Rock Company, working in conjunction with state maintenance forces, has completed its contract for the application of light fuel oil on Route 49 between Middletown and old Williams road, a distance of 23 miles. This work, which connects with Route 15 to Lakeport and Upper Lake, will insure much comfort and pleasure to the many tourists visiting this "Switzerland of America" this coming season.

Route 15, between Upper Lake and Ukiah, which passes the beautiful Blue Lakes, is being improved by the application of about 6 miles of armor coat over

the existing pavement by state maintenance forces. This work will be completed about the middle of June.

LOS ANGELES COUNTY

A contract has been awarded to Ben F. Dupuy for oiling shoulders on the Roosevelt Highway between the westerly boundary of Los Angeles County and Santa Monica. It is expected that this contract will be completed by July 1, 1930.

The contract for a line change immediately north of the Newhall Tunnel has just been completed by McCray Co. This contract is approximately one mile in length and is on much better alignment than the old highway.

The first contract on the La Canada-Mt. Wilson highway for grading 2.6 miles of roadbed was awarded to H. W. Rohl Company on August 14, 1929. Work is rapidly nearing completion and it is expected that this contract will be completed by July 1, 1930.

The second contract on the La Canada-Mt. Wilson highway for grading one and one-half miles of highway was awarded to T. M. Morgan Paving Company on January 27, 1930. This extends northerly from the end of the H. W. Rohl contract. This contract will probably require more than a year to complete.

A contract for paving the Newhall Alternate with Portland cement concrete, 30 feet wide, has been awarded to Jahn & Bressi. Grading of this section has just been completed by LeTourneau & Lindberg. The new location is on greatly improved alignment and eliminates Saugus, Newhall and the Newhall Tunnel from the Ridge Route. This section is 8.6 miles long. Paving will probably be completed by August 1st.

A contract for grading and paving a line change near Liberty School, four miles west of Calabasas, was awarded to the Will F. Peck Company January 18, 1930. This line change eliminates several bad curves and improves the grade. Grading work is now in progress. It is expected that this contract will be completed next September.

A contract for grading a 38-foot roadbed on the first section of the Alternate Ridge Route from Castaic School to Canton Creek was awarded to H. E. Doering, von der Hellen and Pierson on February 25, 1930. This section is 7 miles in length and will probably require more than a year to complete.

Surveys are in progress on the rest of this route which will be a saving of more than 7 miles in distance over the present Ridge Route.

MARIN COUNTY

The grading contract of Granfield, Farrar & Carlin for constructing the 4.4 miles section of new highway between San Rafael and Alto has practically been completed. This section of highway, which will supersede the original location through the towns of San Anselmo, Ross, Kentfield, Larkspur and Corte Madera, with a net present saving in distance of 2½ miles to Alto and an ultimate saving of 3¾ miles to Manzanita, has been advertised for bituminous macadam surfacing 30 feet in width. Proposals are to be taken on June 4th. The present project involves some 475,000 cubic yards of roadway excavation.

Three important major structures are nearing completion on this section of the highway. The first of these—an overhead crossing over the tracks of the

Northwestern Pacific Railroad near Greenbrae—consisting of one 38-foot and two 21-foot concrete girder spans, has been practically completed under contract of Siemer & Kendall and F. J. Main. The second major structure under contract with the Butte Construction Company over the Corte Madera Creek at Greenbrae, consisting of a bascule span over a clear channel of 40 feet and approximately 855 feet of timber trestle approach on pile bents, is progressing nicely, foundations for bascule span and trestle approaches having been completed. The third structure consists of one 150-foot steel truss span on concrete piers, one 41-foot and one 28-foot steel beam span on steel frame bents, and approximately 700 feet of timber trestle, is also progressing nicely under contract with the Frederickson and Watson Construction Company and Frederickson Brothers. One of the main span trusses has been set and the other is now in process of erection.

All work on the section between Alto and San Rafael was planned so that the date of completion of the structure and of the surfacing contract shortly to be let would practically coincide in order to open this section to provide for the heavy late summer and fall traffic.

Granfield, Farrar & Carlin also have the contract for grading and paving that 1.8 mile section of Route 1, between San Rafael and Gallinas Creek, upon a revised location which will net a saving of $\frac{1}{4}$ mile in distance.

This project, which is approximately 50 per cent completed at this time, calls for grading a 40-foot roadbed for 1.3 miles and a 50-foot roadbed for 0.5 mile, with 0.6 mile of 20-foot concrete pavement 7 to 9 inches in thickness, 0.4 mile of 30-foot concrete pavement, and 0.7 mile of 20-foot bituminous macadam and 0.1 mile of 30-foot bituminous macadam.

A major structure under contract to Rocco and Colletti over the Northwestern Pacific Railroad's Forbes Station in this section of highway, which consists of one 46-foot steel beam span and 190 feet of timber trestle approach on pile bents, is progressing nicely. This work should be completed at approximately the same time as surfacing and structure contracts between San Rafael and Alto, giving the public the use of the new highway from Alto to Ignacio by late summer. The section of the Redwood Highway from Forbes to Ignacio was graded and paved with a 20-foot width of Portland cement concrete by the Hanrahan Company in 1929.

MARIN AND SONOMA COUNTIES

Another major length of Route 1, the Redwood Highway, extending from Ignacio in Marin County to Petaluma in Sonoma County, a distance of 11.9 miles, is progressing rapidly under contract with the Hanrahan Company, the work being approximately 60 per cent complete. This project calls for some 350,000 cubic yards of roadway excavation upon revised location, which shows a net saving of approximately $\frac{1}{2}$ mile in distance from that of the original highway. It is being graded to a 40-foot roadway width with pavement 20 feet in width, 2.2 miles of which over the heavier newly graded portion is bituminous macadam, the balance being Portland cement concrete. Approximately 0.8 mile of the section to be paved with bituminous macadam has been set aside for experimental section for the purpose of trying out new methods expected to give a smoother and better riding pavement than it has been possible to obtain heretofore with this type. The date

of completion for this work has been set at September 25, 1930, and present indications are that the contractor will complete this work within the time limit specified. Its completion will give a major paved highway from Alto to Cloverdale.

One major structure across San Antonio Creek, under contract with McDonald and Maggiori, has been completed and accepted within the past month. This structure consisted of three 40-foot reinforced concrete girder spans, and cost \$30,400.

MENDOCINO COUNTY

Von der Hallen and Pierson expect to complete within another week the construction of approximately 425 feet of rubble masonry retaining wall at approximately 9 miles south of the Mendocino-Humboldt County line.

The contract for placing a 4-inch thickness of crushed gravel surfacing on portions of the Redwood Highway between a point two miles south of Arnold and the Sherwood-Laytonville road has been practically completed by contractors Hemstreet and Bell, and they are starting on their second contract of producing additional crushed rock screenings and stock piling the same in the vicinity of Long Valley Creek bridge.

Route 1, the Redwood Highway, between Cloverdale and Willits, is being resurfaced by state maintenance forces through the application of an armor coat over the present pavement, a total distance of approximately 20 miles, 8 miles being between Ukiah and Forsythe Creek, and 12 miles between Hopland and Cloverdale. Primary application of the light fuel oil on the present roadway has been fully completed, and armor coating is well under way and should be completed early in July in time to take care of the heavy summer tourist traffic on the main artery to the Redwood Empire.

The Basalt Rock Company, in conjunction with state maintenance forces, is applying light fuel oil under contract on 38 miles of Route 48, McDonald-to-the-Sea Highway. This work should be completed by June 1st and will offer a delightful side trip from Route 1 for tourists and sportsmen during the coming season.

MONTEREY COUNTY

The new subway under the Southern Pacific Railroad at Spence, five miles south of Salinas, has just been opened for traffic. This structure eliminates a dangerous grade crossing.

Satisfactory progress is being made on the new bridge at San Ardo. Ben C. Gerwick is the contractor on the bridge under the supervision of the Bridge Department. Frederickson & Watson and Frederickson Brothers are the contractors on the approaches.

On the San Simeon-Carmel Highway, construction work is in progress with convict labor. Two camps are maintained. At Little Sur a crew of fifty men and two power shovels are working, and between Villa Creek and Willow Creek, seventy men and three power shovels are working. About 7.4 miles of graded roadway have been completed.

Surveys for the location of the road are in progress between the two camps.

A timber bridge is being constructed across Alder Creek under the supervision of the Bridge Depart-

ment. The Dean Construction Co. of Berkeley is contractor.

Bids are being received for a new bridge across the Salinas River at Bradley. This will be under the supervision of the Bridge Department.

NEVADA COUNTY

Grading between Nevada City and one mile west of Washington road on the Ukiah-Tahoe Highway has been completed, oil treated stone surfacing is 80 per cent complete, and the entire project will be finished, it is estimated, by next July. C. R. Adams has the contract for both the grading and the surfacing.

ORANGE-LOS ANGELES COUNTIES

A contract for oiling shoulders between Galivan and Irvine and from Fullerton to Leffingwell Ranch in Los Angeles County has been awarded to G. M. Duntley. It is expected that this contract will be completed by July 1st.

ORANGE COUNTY

A contract for widening the roadbed between Sunset Beach and Newport the entire width of the 90 to 100-foot right of way, and the placing of an additional 10-foot strip of Portland cement concrete has been awarded to the Macco Construction Company. When this work is completed the pavement will be 30 feet wide for the entire distance. It is expected that this work will be completed by next September.

PLACER AND NEVADA COUNTIES

Resumption of 20 miles of grading after the winter shutdown on the highway between Airport and Soda Springs, a part of the Dutch Flat-Donner Lake wagon road, has been made by both T. E. Connolly, who has the contract for the first 9½ miles, and by Callahan Construction Co., who have the contract for the last 10½ miles. Seven miles of the Callahan job, between Big Bend Rangers Station and the end of the work has been completed and is ready for the surfacing which has been programmed for the entire length of the new grade. All of the grading is scheduled for completion by this coming fall and the surfacing is estimated to be completed by the summer of 1931.

SAN BENITO COUNTY

A survey is in progress for the relocation of the state highway between Salinas and San Juan Bautista by way of Prunedale. This will completely eliminate from the Coast Highway the present San Juan grade, which is one of the worst sections on this highway. This change is partly in Monterey County and partly in San Benito County.

SAN DIEGO COUNTY

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines road has just

been completed by the R. E. Hazard Contracting Company. This section is 5.4 miles long and is a 46-foot graded roadbed.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro highway has just been completed by the Nevada Contracting Company.

A contract for grading 2.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded June 25, 1929, to Basich Brothers. This section is on the San Diego-El Centro highway. Work on this section is rapidly nearing completion. It is expected that this contract will be finished by July 1, 1930.

A contract for grading a 30-foot roadbed between Miller Creek and Tecate Divide on the San Diego-El Centro highway was awarded to Monarch & Breen on August 17, 1929. This work is rapidly nearing completion and should be finished by July 1, 1930.

A contract for oiling the shoulders on various stretches aggregating approximately 35 miles between San Diego and Myers Creek Bridge on the San Diego-El Centro highway was recently awarded to the Gilmore Oil Company. It is expected that this contract will be finished by July 1.

Another contract for oiling the highway shoulders between Oceanside and the Orange County line has been completed by G. M. Duntley, contractor.

A contract for widening the roadbed and paving with Portland cement concrete 30 feet wide across San Mateo Flat, between San Onofre and San Clemente, has been awarded to Match Bros., contractors. The new pavement will be 0.57 of a mile long.

SAN LUIS OBISPO COUNTY

Work is nearing completion on the construction of a 20-foot asphaltic concrete pavement between Atascadero and Paso Robles. Steele Finley is the contractor.

Street improvements, including a half mile of state highway, in the town of Atascadero is complete. The work was handled by a local improvement district. M. J. Bevanda was the contractor.

On the Coast Highway between Santa Maria River and Los Berros Creek, a distance of 7.2 miles, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Grading work is complete and rapid progress is being made on the pavement. J. F. Knapp is the contractor.

Plans have been completed for the proposed reconstruction of the Coast Highway between San Luis Obispo and Cuesta Grade, a distance of about three miles, and this work will soon be advertised.

SAN MATEO COUNTY

Construction of the first link of the Bayshore Highway, which has been located as an express road to facilitate fast moving traffic between the cities of San Francisco and San Jose, is nearing completion under contract with the H. W. Rohl Company. This project would have been completed some time ago but for the occurrence of heavy slides near Visitation. The slide material has been utilized in improving the grades and in further widening of the roadway. Between Visitation and Sierra cut a 4 per cent grade has thus been eliminated, being replaced by a 1 per cent grade. This project, which extends from the San Diego County line at the city limits of San

Francisco to the north city limits of the city of South San Francisco, a distance of $3\frac{1}{2}$ miles, involves over 1,000,000 yards of grading.

Another major link of the Bayshore Highway extending 7.3 miles between the towns of San Mateo and Redwood City, under contract with Frederick & Watson Construction Company and Frederickson Bros., is now about 35 per cent completed. This project extends across the marshes and salt ponds along the westerly side of San Francisco Bay and involves some 630,000 cubic yards of grading quantities, about 40 per cent of which is composed of hydraulic fill between previously constructed levees. The balance of this material is being taken from Belmont Hill, some 250,000 yards having been placed at the present time between Belmont and San Mateo.

With a paving contract of 40 feet width concrete between the cities of South San Francisco and Burlingame and another grading contract between Redwood City and Palo Alto shortly to be advertised for bids, this highway will assume its portion of the traffic from the overburdened Peninsula Highway. This should develop much industrial property along the shores of San Francisco Bay.

Under state maintenance forces 11 miles of Route 55, Skyline Boulevard, between Tanforan road and La Honda road, work has just been completed on the placing of an armor coat. Heavy traffic is expected on this road during the summer months, particularly on holidays. An additional 14 miles of the Skyline Boulevard, between La Honda Road and Saratoga Summit, is being given a light oil seal coat at the present time by state maintenance forces.

Due to the fact that Route 55 follows the ridge along the county line, this section lies within three different counties, San Mateo, Santa Clara and Santa Cruz, swinging back and forth across the boundary line in numerous places. This work should be completed by the middle of June.

SANTA BARBARA COUNTY

On the Coast Highway between Wignmore and Zaca, a distance of 4 miles, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Placing of pavement is progressing. The Cornwall Construction Company is the contractor.

On the Cuyama lateral the road is being oiled from Buckhorn Canyon to the second crossing of the Cuyama River. The Gilmore Oil Company is the contractor.

On the Coast Highway from the Elwood overhead to Goleta, and from Carpinteria to the Rincon cut-off, the shoulders are being oiled. The Bradley Truck Company is the contractor.

Bids will be opened on June 11 for the grading and surfacing with oiled crushed gravel or stone of the Cuyama lateral from the third crossing of the Cuyama River to the Kern County line, a distance of about 26.2 miles. A portion of this project is located in San Luis Obispo County.

SANTA CLARA COUNTY

Contract of the Hanrahan Company for grading and paving from San Francisco Creek through the towns of Palo Alto and Mayfield to San Antonio road, a distance of 4.1 miles, has passed the preparatory stages and paving operations are to be commenced

immediately. This project calls for graded roadbed 56 feet in width with 40 feet width of pavement Portland cement concrete and asphalt concrete for the first 2.2 miles, being that part through the towns, the balance being a graded roadway width of 50 feet with 30 feet width of pavement.

Right of way is being widened to 100 feet throughout and, due to the urban nature of the territory through which this project passes, it calls for the solving of many complicated problems.

Paving operations are being started at the south end of the project.

The present construction is an important link on Route 1, "El Camino Real," between San Francisco and San Jose.

The 4.9 miles section of this highway adjoining the present project on the south has been advertised, bids being called for on June 11, 1930.

SANTA CRUZ COUNTY

Contractor Jack Casson, working with state maintenance forces, has just completed the application of a light fuel oil seal coat on Route 42 on Saratoga Summit to and through California Redwood Park, a distance of 23 miles.

VENTURA COUNTY

A contract has been awarded to California Road Oil Service for oiling shoulders from Camarillo to Ventura and from Ventura to Seacliff. It is expected that this contract will be completed by July 1st.

YUBA COUNTY

A 20-foot Portland cement concrete pavement on partly new alignment through Wheatland has been contracted for by C. W. Wood. Minor drainage structures and grading recently begun are to precede the pouring of the concrete pavement. Rock borders, 3 feet wide on each side of the pavement, will be constructed after the concrete is all poured. It is contemplated that the entire project will be completed by next August.

LIST OF HIGHWAY BIDS

For Month of May

ALPINE COUNTY—Oiling 8.6 miles between Hangmans Bridge and Woodfords. Dist. X, Rt. 23, Secs. C. D. Basalt Rock Co., Napa, \$3,312. Contract awarded to Skeels & Graham Co., Roseville, \$3,264.

DEL NORTE COUNTY—Between Smith River and Patricks Creek, 15.2 miles to be surfaced with untreated gravel or stone. Dist. I, Rt. 1, Secs. C. D. Tieslau Bros., Berkeley, \$39,217; Hemstreet & Bell, Marysville, \$40,810. Contract awarded to Smith Bros., Eureka, \$32,650.

COLUSA COUNTY—Between Williams and Maxwell, 8.3 miles to be graded. Dist. III, Rt. 7, Secs. B, C. Lord & Bishop, Sacramento, \$85,504; M. J. Bevanda, Stockton, \$69,500; Isbell Construction Co., Fresno, \$89,377; T. M. Morgan Paving Co., Los Angeles, \$74,944; Kennedy-Bayles Construction Co., Biggs, \$71,052; A. Teichert & Son, Sacramento, \$78,-

918; Geo. Pollock Co., Sacramento, \$74,736; The Utah Construction Co., San Francisco, \$62,297; Hemstreet & Bell, Marysville, \$72,735; C. W. Wood, Stockton, \$68,650; J. P. Holland, Inc., San Francisco, \$87,871; Yglesias Bros., Inc., San Diego, \$74,595. Contract awarded to Frederickson & Watson Const. Co., Oakland, \$58,269.

COLUSA-GLENN COUNTIES—Between Hunter's Creek and $\frac{1}{2}$ mile north of county boundary line, constructing 1.9 miles drainage ditch. Dist. III, Rt. 7, Secs. C, A. Hemstreet & Bell, Marysville, \$8,091; Freeman & Murch, Willows, \$6,906; J. R. Reeves, Sacramento, \$8,004; J. P. Holland, Inc., San Francisco, \$7,703; Frederickson-Watson, Oakland, \$9,379; M. J. Treaster, Sacramento, \$6,666. Contract awarded to Lilly, Willard & Biasotti, Stockton, \$6,421.50.

HUMBOLDT COUNTY—At Scotia and between Fortuna and Loleta, 4.3 miles to be graded and paved with Portland cement concrete. Dist. I, Rt. 1, Secs. E, G. Engelhart Paving and Construction Co., Eureka, \$158,653; M. J. Bevanda, Stockton, \$159,352; C. W. Wood, Stockton, \$166,209; N. M. Ball, Porterville, \$165,498. Contract awarded to J. V. Galbraith, Petaluma, \$148,707.40.

HUMBOLDT COUNTY—Between Loleta and 2 miles north of Beatrice, 5.2 miles to be surfaced with river run gravel, of which 2.6 miles is to be graded. Dist. I, Rt. 1, Sec. G. Geo. Pollock Co., Sacramento, \$69,155; W. C. Colley, Berkeley, \$64,723; Hemstreet & Bell, Marysville, \$69,698; Engelhart Paving and Construction Co., Eureka, \$71,200; Larsen Bros., Galt, \$74,859; Jasper-Stacy Co., San Francisco, \$79,952; C. W. Wood, Stockton, \$63,409; E. C. Coats, Sacramento, \$59,200. Contract awarded to J. P. Holland, Inc., San Francisco, \$51,480.70.

LASSEN-SIERRA COUNTIES—Between 2 miles west of Milford and state line, 52.2 miles to be oiled with heavy fuel oil furnished and applied as dust layer. Dist. II, Rt. 29, Secs. A, D, E, F. Basalt Rock Co., Napa, \$12,652. Contract awarded to Jack Casson, Hayward, \$12,594.

MENDOCINO COUNTY—Near Longvale and Long Valley Creek Bridge, furnishing and stockpiling untreated crushed gravel or stone surfacing and screenings. Dist. I, Rt. 1, Sec. G. Hemstreet & Bell, Marysville, \$9,750.

MONO COUNTY—Between the summit of Sherwin Hill and Devil's Punch Bowl, 24 miles furnishing and applying heavy fuel oil as dust layer. Dist. IX, Rt. 23, Secs. B, C, D, E. California Road Oil Service, Wilmington, \$17,149; Basalt Rock Co., Inc., Napa, \$13,289; Gilmore Oil Co., Los Angeles, \$14,558; G. M. Duntley, Los Angeles, \$16,264; Ben F. Dupuy, Los Angeles, \$17,058. Contract awarded to Leonard C. Pulley, Long Beach, \$11,464.63.

MONO COUNTY—Between Devil's Punch Bowl and Leevining and Ft. Bridgeport, 16.3 miles to have furnishing and applying of heavy fuel oil as dust layer. Dist. IX, Rt. 23, Secs. F, G, I. G. M. Duntley, Los Angeles, \$11,981; Gilmore Oil Company, Ltd., Los Angeles, \$11,681; California Road Oil Service, Wilmington, \$12,017; Basalt Rock Company, \$10,596. Contract awarded to Leonard C. Pulley, Long Beach, \$8,987.40.

MONTEREY COUNTY—Timber bridge across Alder Creek, about 29 miles north of San Simeon, consisting of sixteen 19-foot spans on frame bents with concrete pedestals. Dist. V, Rt. 56, Sec. A. H. C. Whitty, \$25,495; M. B. McGowan, San Francisco, \$25,880; Smith Bros., Eureka, \$27,510; R. B. Mc-

Kenzie, Red Bluff, \$24,346; Granite Construction, Watsonville, \$25,598; Theo. M. Maino, \$26,801. Contract awarded to Dean Construction Co., Berkeley, \$24,246.

RIVERSIDE COUNTY—Between Indio and Oasis, furnishing and spreading fuel oil on shoulders for about 8.5 miles. Dist. VIII, Rt. 26, Sec. F. Leonard C. Pulley, Long Beach, \$7,713; G. M. Duntley, Los Angeles, \$8,355; California Road Oil Service Co., Los Angeles, \$8,527; Basalt Rock Co., Inc., Napa, \$9,169; Ben F. Dupuy, Los Angeles, \$9,384. Contract awarded to Gilmore Oil Co., Ltd., Los Angeles, \$7,670.15.

SAN BERNARDINO COUNTY—Bridge across Mojave River, 3 miles north of Victorville, consisting of one 270-ft. through steel truss span, five 51-ft. concrete girder spans and one 48-ft. concrete girder span on concrete piers and bents. Dist. VIII, Rt. 31, Sec. D. Torson Const. Co., Long Beach, \$149,122; Carpenter Bros., Beverly Hills, \$131,806; H. W. Rohl Co., Los Angeles, \$136,203; Lynch-Cannon Engineering Co., Los Angeles, \$143,664; Gist & Bell, Arcadia, \$144,908; Rocca & Caletti, San Rafael, \$126,704; Lord & Bishop, Sacramento, \$152,698; Whipple Engr. Co., Monrovia, \$132,300. Contract awarded to J. F. Knapp, Oakland, \$118,460.50.

SAN BERNARDINO COUNTY—Between Fawn-skin and county road, 7 miles to have furnished and spread fuel oil on roadway. Dist. VIII, Rt. 43, Sec. D. Ben F. Dupuy, Los Angeles, \$2,478; G. M. Duntley, Los Angeles, \$2,836. Contract awarded to Gilmore Oil Co., Ltd., Los Angeles, \$2,283.44.

SAN BERNARDINO COUNTY—At Mojave River, 0.8 of a mile to be graded, approach to new bridge. Dist. VIII, Rt. 31, Sec. D. J. F. Knapp, Oakland, \$21,891; Triangle Rock and Gravel Co., San Bernardino, \$16,149; Bert Calvert, Los Angeles, \$18,630; General Engineering Corp., Ltd., Los Angeles, \$28,187. Contract awarded to C. G. Willis & Sons, Inc., Los Angeles, \$15,019.

SAN DIEGO COUNTY—Between San Onofre and San Clemente, 0.9 of a mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 2, Sec. D. Watson & Sutton, San Diego, \$41,314; Robinson, Roberts Co., Los Angeles, \$46,963; Sander Pearson, Santa Monica, \$41,255; Bruce Bros., Inc., Huntington Beach, \$42,125; R. E. Hazard Const. Co., \$46,961; Maceo Const. Co., Clearwater, \$38,675; Bert Calvert, Los Angeles, \$40,582. Contract awarded to Matich Bros., Elsinore, \$38,118.80.

SAN JOAQUIN COUNTY—Between Lodi and $\frac{1}{4}$ mile north of Mokelumne River, 0.7 of a mile to be graded and surfaced with untreated crushed gravel. Dist. X, Rt. 4, Sec. C. J. P. Holland, Inc., San Francisco, \$28,840; Frederickson & Watson Const. Co., Oakland, \$23,718; C. W. Wood, Stockton, \$25,263; Lilly, Willard & Biasotti, Stockton, \$22,327; T. M. Morgan Paving Co., Los Angeles, \$26,118; A. Teichert & Son, Sacramento, \$26,441; Larsen Bros., Galt, \$28,309; Pereira & Reed, Tracy, \$29,744; W. C. Colley, Berkeley, \$34,545. Contract awarded to D. McDonald, Sacramento, \$22,147.10.

SAN JOAQUIN COUNTY—Bridge across Mokelumne River near Lodi, consisting of 3 54-ft. reinforced concrete girder spans on concrete piers with pile foundations and 35 19-ft. timber approach spans with concrete deck on pile bents. Dist. X, Rt. 4, Sec. C. Ward Engineering Co., San Francisco, \$92,552; Healey-Tibbitts Const. Co., San Francisco, \$110,781; M. B. McGowan, San Francisco, \$96,644; A. W. Kitchen, San Francisco, \$113,509; Jacobs & Pattiani, Oakland, \$88,703; Lord & Bishop, Sacramento, \$94,-

822; Bodenhamer Const. Co., San Diego, \$105,201; The Utah Const. Co., San Francisco, \$103,732; Butte Construction Co., San Francisco, \$103,249; Fredrickson & Watson, Oakland, \$89,297. Contract awarded to J. S. Metzger & Son, Stockton, \$84,379.50.

WATER APPLICATIONS AND PERMITS

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of May, 1930.

INYO COUNTY—Permit 3470, Application 6368. Issued to Pacific Sulphur Corp., Bishop, May 7, 1930, for 0.11 c.f.s. from Lost Chance Springs in Sec. 2, T. 8 S., R. 39 E., M. D., for mining, milling and domestic. Water will not be returned to stream.

TUOLUMNE COUNTY—Permit 3471, Application 6541. Issued to Joseph Brown, Chinese Camp, May 12, 1930, for 0.25 c.f.s. from Smarts Gulch in Sec. 18, T. 1 S., R. 15 E., M. D., for domestic and stock watering. Estimated cost \$550.

HUMBOLDT COUNTY—Permit 3472, Application 6429. Issued to C. M. Salyer, Salyer, May 15, 1930, for 125 c.f.s. from Campbell Creek in Sec. 20, T. 6 N., R. 5 E., H. M., for mining. Estimated cost \$81,000.

SAN BERNARDINO COUNTY—Permit 3473, Application 6566. Issued to Christian Baumann, Phelan, May 19, 1930, for 0.035 c.f.s. from 4 unnamed springs in Sec. 31, T. 4 N., R. 7 W., S. B. M., for domestic and recreational. Estimated cost \$2,500.

LOS ANGELES COUNTY—Permit 3474, Application 6520. Issued to Candido Herrero, San Fernando, May 20, 1930, for 0.937 c.f.s. from Muerte Canyon (underground water) in Sec. 34, T. 3 N., R. 14 W., S. B., for irrigation and domestic on one acre. Estimated cost \$2,600.

LOS ANGELES COUNTY—Permit 3475, Application 6565. Issued to I. A. Sharp, Palmdale, May 20, 1930, for 0.025 c.f.s. from Deer Spring in Sec. 14, T. 6 N., R. 14 W., S. B., for irrigation and domestic on 2 acres. Estimated cost \$425.

DEL NORTE COUNTY—Permit 3476, Application 6567. Issued to Frank Symms, Crescent City, May 21, 1930, for 0.01 c.f.s. from unnamed creek in Sec. 30, T. 17 N., R. 2 E., H. M., for domestic purposes. Estimated cost \$200.

EL DORADO COUNTY—Permit 3477, Application 6549. Issued to L. T. Butts, Placerville, May 23, 1930, for 0.12 c.f.s. from Emigrant Ravine Creek in Sec. 5, T. 10 N., R. 11 E., M. D., for irrigation on 10 acres. Estimated cost \$500.

AMADOR COUNTY—Permit 3478, Application 6576. Issued to E. T. Bamert, Clements, May 23, 1930, for 1.25 c.f.s. from Mokelumne River in Sec. 4, T. 4 N., R. 9 E., M. D. M., for irrigation on 100 acres. Estimated cost \$4,000.

CONTRA COSTA COUNTY—Permit 3479, Application 6587. Issued to Henry R. Vail, Oakland, May 24, 1930, for 37 c.f.s. from Old River, Dredger Cut and Italian Slough in Secs. 6, 7, 18, T. 1 S., R. 4 E., M. D. B. & M.; Sec. 13, T. 1 S., R. 3 E., M. D. B. & M., for irrigation on 2359.90 acres. Estimated cost \$10,000.

LOS ANGELES COUNTY—Permit 3480, Application 5406. Issued to Big Rock Ranch Co., Los Angeles, May 28, 1930, for 6000 acre-feet per annum from Big Rock Creek, surface and underground, in Secs. 6, 8, T. 4 N., R. 9 W., S. B. M., for irrigation and domestic on 2520 acres. Estimated cost \$150,000.

EL DORADO COUNTY—Permit 3481, Application 6383. Issued to Pacific Gas and Electric Co., San Francisco, May 28, 1930, for 15 c.f.s. from Alder Creek in Sec. 36, T. 11 N., R. 14 E., M. D. M., for power purposes. Estimated cost \$25,000.

SAN JOAQUIN COUNTY—Permit 3482, Application 6588. Issued to American Trust Co., San Francisco, May 28, 1930, for 1.75 c.f.s. from Stanislaus River in Sec. 21, T. 2 S., R. 8 E., M. D. M., for irrigation in 140 acres. Estimated cost \$2,500.

SAN JOAQUIN COUNTY—Permit 3483, Application 6529. Issued to H. R. Russell, Modesto, May 28, 1930, for 1.91 c.f.s. from drainage or waste ditch of Oakdale Irrigation district draining through natural depression

in Sec. 17, T. 1 S., R. 9 E., M. D. M., for irrigation on 153 acres. Estimated cost \$50.

INYO COUNTY—Permit 3484, Application 4214. Issued to Burnham Chemical Co., Westend, May 29, 1930, for 0.42 c.f.s. from 2 springs in Sec. 22, T. 23 S., R. 42 E., M. D. M., for domestic and mining. Estimated cost \$50,000.

INYO COUNTY—Permit 3485, Application 4498. Issued to Burnham Chemical Co., Westend, May 29, 1930, for 0.09 c.f.s. from Homewood Spring in Sec. 31, T. 23 S., R. 43 E., M. D. M., for domestic and mining. Estimated cost \$35,000.

INYO COUNTY—Permit 3486, Application 5955. Issued to Burnham Chemical Co., Westend, May 29, 1930, for 0.065 c.f.s. from 2 springs and 12 underground water developments in Parsons and Burnett Canyon in Secs. 32, 33, 34, T. 23 S., R. 42 E., M. D. M., for domestic and mining. Estimated cost \$10,000.

INYO COUNTY—Permit 3487, Application 5932. Issued to American Potash and Chemical Corp., Trona, May 29, 1930, for 0.0337 c.f.s. from Avalon Springs in Sec. 1, T. 24 S., R. 42 E., M. D. M., for industrial, domestic and mining. Estimated cost \$10,800.

INYO COUNTY—Permit 3488, Application 5933. Issued to American Potash and Chemical Corp., Trona, May 29, 1930, for 0.11 c.f.s. from Avalon Wash in Sec. 1, T. 24 S., R. 42 E., M. D. M., for industrial, domestic and mining. Estimated cost \$360.

INYO COUNTY—Permit 3489, Application 5934. Issued to American Potash and Chemical Corp., Trona, May 29, 1930, for 0.11 c.f.s. from Pot Hole Spring in Sec. 12, T. 24 S., R. 42 E., M. D. M., for industrial, domestic and mining. Estimated cost \$840.

INYO COUNTY—Permit 3490, Application 4973. Issued to Engineers Exploration Corp., Los Angeles, May 31, 1930, for 0.06 c.f.s. from Bainter Spring in Sec. 18, T. 24 S., R. 43 E., M. D. M., for domestic and mining. Estimated cost \$1,500.

INYO COUNTY—Permit 3491, Application 5998. Issued to Nellie E. Dean, Pasadena, May 31, 1930, for 0.25 c.f.s. from Sweepstakes Spring in Sec. 26, T. 23 S., R. 42 E., M. D. M., for mining and domestic. Estimated cost \$2,000.

Applications for permit to appropriate water filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1930.

MOJAVE COUNTY—Application 6665. Cedarville Civic Club, c/o Mrs. Ray Hill, president, Cedarville, for 0.75 c.f.s. from Quail Creek Spring tributary to Deep Creek to be diverted in Sec. 2, T. 42 N., R. 15 E., M. D. M., for domestic and municipal purposes. Estimated cost \$10,000.

TRINITY COUNTY—Application 6666. Morris Group Gold Mining Company, c/o H. W. Brannan, Burnt Ranch, for 10 c.f.s. from Clark Creek tributary to Etterman Creek, South Fork Trinity River, to be diverted in Sec. 20, T. 4 N., R. 7 E., H. B. M., for mining and domestic purposes. Estimated cost \$2,500.

SAN DIEGO COUNTY—Application 6667. Hallam C. Stone, Box 584, El Cajon, for 0.5 c.f.s. from Campo Creek, also underground water tributary to Tecate River to be diverted in Sec. 19, T. 18 S., R. 5 E., S. B. M., for irrigation and domestic purposes on 70 acres. Estimated cost \$5,000.

EL DORADO COUNTY—Application 6668. A. Carlson, Camino, for 0.5 c.f.s. from waste and seepage water tributary to North Canyon, tributary to South Fork American River, to be diverted in Sec. 6, T. 10 N., R. 12 E., M. D. M., for irrigation and domestic purposes on 70 acres. Estimated cost \$2,000.

SAN BERNARDINO COUNTY—Application 6669. Geneva Catherine Baxter, Victorville, Lucerne Valley, for 0.26 or approximately 10 1/2 miners inches from Deep Creek Canyon and six unnamed springs tributary to Mojave Desert to be diverted in Secs. 16 and 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic purposes on 20 acres.

SUTTER COUNTY—Application 6670. H. S. Fasig and W. H. Saylor, Knights Landing, for 3.46 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 14, T. 13 N., R. 1 E., M. D. M., for irrigation purposes on 276.81 acres. Estimated cost \$4,000.

BUTTE COUNTY—Application 6671. Charles M. Lee, Rt. 1, Box 197 A, Oroville, for .5 c.f.s. from Cottonwood Creek tributary to Sacramento River to be diverted in Sec. 33, T. 20 N., R. 3 E., M. D. M., for domestic and recreational purposes. Estimated cost \$25.

COLUSA COUNTY—Application 6672. Colusa Development Co., a corporation, c/o Thos. Rutledge, Colusa, for 9.87 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 26, T. 14 N., R. 1 E., M. D. M., for irrigation and domestic purposes on 787.7 acres. Estimated cost \$20,000.

RIVERSIDE COUNTY—Application 6673. Motor Transit Terminal Corp., 1005 S. Mateo St. Los Angeles, for 0.75 c.f.s. from a pond for irrigation purposes on 30 acres. Estimated cost \$200.

MONO COUNTY—Application 6674. L. L. Alauzet, 3925 W. 23d St., Los Angeles, for 200 gallons per day from Lower Rock Creek tributary to Owens River to be diverted in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$250.

SIERRA COUNTY—Application 6675. Charles E. Herron, c/o Geo. F. Taylor, Downieville, for 25 c.f.s. from Goddard Creek tributary to North Fork of Yuba River to be diverted in Sec. 9, T. 20 N., R. 10 E., M. D. M., for mining purposes.

SAN BERNARDINO COUNTY—Application 6676. The Mojave River Irrigation District, c/o Meserve, Munger, Hughes & Robertson, 615 Richfield Bldg., Los Angeles, for 30,000 acre-feet per annum from Deep Creek and West Fork Mojave River tributary to Mojave River to be diverted in Secs. 17 and 18, T. 3 N., R. 3 W., S. B. M., for irrigation purposes on 26,875.36 acres.

MODOC COUNTY—Application 6677. Russell M. Bushey, Canby, for .12 c.f.s. from unnamed stream tributary to Pit River watershed to be diverted in Sec. 7, T. 41 N., R. 9 E., M. D. M., for irrigation and domestic purposes on 10 acres. Estimated cost \$5.

SACRAMENTO COUNTY—Application 6678. G. H. Moreland, Rt. 6, Box 4320, Sacramento, for 0.3 c.f.s. from Dry Creek tributary to Sacramento River to be diverted in Sec. 32, T. 10 N., R. 5 E., M. D. M., for irrigation purposes on 24.4 acres. Estimated cost \$500.

EL DORADO COUNTY—Application 6679. Sierra Camps, Inc., Frank Kleeberger, president, of University of California, Berkeley, for 0.1 c.f.s. from Palston Creek tributary to Upper Echo Lake to be diverted in Sec. 34, T. 12 N., R. 17 E., M. D. M., for recreational and domestic use. Estimated cost \$200.

EL DORADO COUNTY—Application 6680. H. V. Madden, Placerville, for .25 c.f.s. and 8 acre-feet per annum from Emigrant Ravine tributary to Hangtown Creek and South Fork American River to be diverted in Sec. 4, T. 10 N., R. 11 E., M. D. M., for irrigation purposes on 35 acres. Estimated cost \$2,000.

MODOC COUNTY—Application 6681. C. C. Jones, Cedarville, for 1.63 c.f.s. from Steamboat Creek tributary to Middle Alkali Lake to be diverted in Sec. 10, T. 41 N., R. 16 E., M. D. M., for irrigation purposes on 130 acres.

LAKE COUNTY—Application 6682. Martin Judge, Jr., and Company, Crocker First National Bank Bldg., San Francisco, for 250 c.f.s. and 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cash Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

LAKE COUNTY—Application 6683. Martin Judge, Jr., and Company, Crocker First National Bank Bldg., San Francisco, for 175,000 acre-feet per annum from North Fork of Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation purposes on 50,000 acres. Estimated cost \$1,000,000.

FRESNO COUNTY—Application 6684. Sherley DeVine, Dunlap, for .01 c.f.s. from an unnamed spring tributary to Mill Creek, thence Kings River, to be diverted in Sec. 4, T. 14 S., R. 27 E., M. D. M., for irrigation and domestic purposes on 1 acre. Estimated cost \$250.

EL DORADO COUNTY—Application 6685. J. S. Goldie, 1500 39th St., Sacramento, for 400 gallons per day from an unnamed creek tributary to South Fork of American River, to be diverted in Sec. 19, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

MONO COUNTY—Application 6686. Clifford E. Brodie, 750 Central Ave., Los Angeles, for 200 gallons per day from Rock Creek tributary to Owens River, for domestic purposes. Estimated cost \$175.

SAN BERNARDINO COUNTY—Application 6687. Stanley Visel, 145 N. Broadway, Suite 200, Los Angeles, for 446 gallons per day from an unnamed spring to be diverted in Sec. 9, T. 2 N., R. 3 W., S. B. M., for domestic purposes. Estimated cost \$300.

MONO COUNTY—Application 6688. E. A. Montgomery, c/o Fred R. Smith, Bishop, for 0.065 c.f.s. from

an unnamed spring tributary to an unnamed watershed, thence Mammoth Valley, thence Owens River, to be diverted in Sec. 11, T. 3 S., R. 31 E., M. D. M., for mining, milling and domestic purposes.

NEVADA COUNTY—Application 6689. South Yuba Company, Ltd., 552 Holbrook Bldg., San Francisco, for 50 c.f.s. from South Yuba River tributary to Yuba River to be diverted in Sec. 8, T. 17 N., R. 11 E., M. D. M., for mining purposes. Estimated cost \$10,000.

DAM APPLICATIONS, APPROVALS AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1930.

NEVADA COUNTY—Lake Olympia Dam No. 213. Thurston & Beaulieu, Grass Valley, owner; concrete, 5½ feet above streambed. Situated on no stream in Sec. 24, T. 16 N., R. 8 E., M. D. M., for storage purposes for recreation use. Estimated cost \$5,000.

PLUMAS COUNTY—Greenbower Dam No. 280. H. J. Greenbower, Meadow Valley, owner; rock and earth, 25 feet above streambed. Situated on dry gully tributary to Middle Fork Feather River in Sec. 6, T. 22 N., R. 7 E., M. D. M., for storage purposes for debris use. Estimated cost \$1,585.

LASSEN COUNTY—Coon Dam No. 249. W. W. Long, Johnstownville, owner; earth and rock, 6 feet above streambed with a storage capacity of 150 acre-feet. Situated on Coon Creek tributary to Horse Lake in T. 33 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$3,000.

LASSEN COUNTY—Fredonia Dam No. 249-2. John K. Long, Susanville, owner; earth, 21 feet above streambed with a storage capacity of 300 acre-feet. Situated on creek tributary to Pine Creek in T. 33 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1,800.

LASSEN COUNTY—Branham Dam No. 249-3. W. W. Long, Johnstownville, owner; earth, 20 feet above streambed with a storage capacity of 600 acre-feet. Situated on Branham Creek tributary to Horse Lake in T. 33 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$2,000.

MONO COUNTY—Black Reservoir No. 533. Schacht & Seitelmeier, Gardnerville, owners; earth, 15 feet above streambed with a storage capacity of 250 acre-feet. Situated on Black Creek tributary to West Walker River, located in Sec. 29, T. 6 N., R. 23 E., M. D. M., for storage purposes and irrigation use.

LASSEN COUNTY—Mitchell Dam No. 243. David S. Mitchell, Susanville, owner; earth, 8 feet above streambed with a storage capacity of 65 acre-feet. Situated on no stream in Sec. 13, T. 35 N., R. 11 E., M. D. M., for storage and diversion purposes for irrigation and stock use. Estimated cost \$750.

SAN DIEGO COUNTY—Miles Dam No. 843. Harriet S. Miles, Grossmont, owner; earth, capacity of 1½ acre-feet. Situated on flume, for storage purposes for irrigation use.

MERCED COUNTY—Crocker Diversion Dam No. 58. Merced Irrigation District, Merced, owner; concrete, 12 feet above streambed. Situated on Merced River in Sec. 7, T. 5 S., R. 15 E., M. D. M., for diversion purposes for irrigation use. Estimated cost \$71,660.

LASSEN COUNTY—Nelson Dam No. 231—F. S. Benedict, Likely, Modoc County, owner; earth, 10 feet above streambed with a storage capacity of 460 acre-feet, situated on Dry Creek tributary to Pit River in Sec. 24, T. 38 N., R. 12 E., M. D. M., for storage purposes for irrigation and stock water use.

MONO COUNTY—Upper Twin Lake Dam No. 521. C. E., J. H. and L. S. Day, Bridgeport, owners; rock fill, 8½ feet above streambed with a storage capacity of 2800 acre-feet. Situated on Robinson Creek tributary to East Walker River, for storage purposes, for irrigation, stock and domestic use.

MONO COUNTY—Lower Twin Lake Dam No. 521-2. Hunewill, Plymouth Land and Stock Co., Simpson & Day, Bridgeport, owners; rock fill, 20 feet above streambed with a storage capacity of 4000 acre-feet. Situated on Robinson Creek tributary to East Walker

River, for storage purposes, for irrigation, stock and domestic use.

VENTURA COUNTY—Lake Eleanor Dam No. 765-2, Elsie L. Canterbury, Hollywood, owner; arch, 30 feet above streambed with a storage capacity of 104 acre-feet. Situated on Eleanor Creek tributary to Triunfo in Sec. 27, T. 1 N., R. 19 W., S. B. M., for storage purposes for recreation use.

EL DORADO COUNTY—Diamond Reservoir No. 462-2, Diamond Ridge Water Co., Diamond Springs, owner; earth and rock, 14 feet above streambed with a storage capacity of 10 acre-feet. Situated on ditch in Sec. 25, T. 10 N., R. 10 E., M. D. M., for storage purposes for irrigation use.

MERCED COUNTY—Yosemite Lake Dam No. 58-3, Merced Irrigation District, Merced, owner; earth, 45.8 feet above streambed with a storage capacity of 7000 acre-feet. Situated on main canal in Sec. 33, T. 6 S., R. 14 E., M. D. M., for storage purposes for irrigation. Estimated cost \$165,000.

Application for approval of Plans and specifications for the repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1930.

INYO COUNTY—Hillside Dam No. 100, Hillside Water Co., Riverside, owner; rock, in Sec. 15, T. 9 S., R. 31 E., M. D. M., install new face.

NEVADA COUNTY—Fuller Lake Dam No. 97-21, Pacific Gas and Electric Co., San Francisco, owner; earth. Situated on Jordan Creek tributary to South Fork Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M., new outlet; granite slab on upstream face.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of May, 1930.

SAN DIEGO COUNTY—Mary Joe Dam No. 841-2, H. F. Schnell, San Diego, California, owner; arch, 28 feet above streambed with a storage capacity of 135 acre-feet. Situated on Skye Valley Creek tributary to Pine Creek in Sec. 2, T. 17 S., R. 3 E., S. B. M., for storage purposes for irrigation and recreation use. Estimated cost \$30,000.

LOS ANGELES COUNTY—Mulholland Dam No. 6-17, City of Los Angeles, Los Angeles, owner; gravity arch. Situated in Weld Canyon. Estimated cost \$293,488.

Plans and specifications for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of May, 1930.

INYO COUNTY—Hillside Dam No. 100, Hillside Water Company, Riverside, owner; rock fill. Situated on South Fork Bishop Creek tributary to Owens River in Sec. 15, T. 9 S., R. 31 E., M. D. M., install new face.

TRAFFIC OFFICERS GO TO SCHOOL

(Continued from page 1.)

a special corps of cooks, assistant cooks and waiters hired for the occasion.

Stringent rules governing the conduct of the students were made and adhered to rigidly. No officer was permitted to leave the grounds without permission and every man was required to attend all classes.

The studies at the school included a score of important subjects, all bearing on the work of the traffic officer, such as accident prevention, efficiency, clearing highways, directing traffic, making reports, courtesy to the public, court procedure, arrests, etc.

Several special lecturers came in at various times for special subjects. Harry Huston, at-

torney for the Division of Motor Vehicles, addressed the school on one occasion on certain phases of the Motor Vehicle Act. Justice of the peace H. P. Andrews, on another occasion, lectured on court procedure.

Daily lessons in jiu jitsu were given by Tommy Burns, a master of the intricate Japanese art. Dr. D. F. Dozier gave daily instruction in first aid.

The school was fortunate at its opening period in having the services of Inspector William H. White, a former colonel in the United States Army, to supervise the close order drills and other phases of military work.

General instruction was given by inspectors Ralph Yoder, Elmer Steinmeyer and M. C. McKee. Inspectors Victor W. Killick, Ed P. Williams, Will R. Sharkey, Jr., George Moynahan, Edward P. Cook and others acted as part-time instructors.

UNIFORM TRAFFIC LAWS TERMED PROBLEM FOR STATES AND CITIES

(Continued from page 12.)

"This subject is one of vital concern to all of us and touches the well-being of the whole people. As such it calls for concerted action not only by governmental authorities of all the states and all the municipalities, but by the national associations and organizations through which the public interest, not to say the public responsibility, is expressed.

"The conference itself is an avowal of this singleness of purpose and of public responsibility. Its conclusions represent the best thought and judgment available brought to focus upon the many aspects of the traffic problem.

ACCOMPLISHMENT RESTS WITH THE STATE

"This is an accomplishment of no little magnitude, but it is the beginning, not the end of your endeavor. The task that remains is to put your conclusions into effect, to apply the solutions upon which you have agreed.

"How is this to be done? It is not for federal government to undertake to carry out your recommendations. That can not be done without violence to our fundamental political principles and the genius of our institutions. It is the proper function and desire of the federal government to assist the states and municipalities in carrying out the purposes of the conference, but not to encroach upon the authority which rightfully belongs to them.

"The task rests primarily with the states. The responsibility is theirs. I think the deliberations of the conference are a convincing guaranty that they will have the earnest support of the organizations and associations which have been represented here.

"Finally the success of this important undertaking rests with the public, the individual citizens whose welfare is the end sought by this gathering.

"May I bespeak for your efforts this necessary individual cooperation and express my own personal appreciation of the highly important work you have done?"

I know a woman who was so down-in-the-mouth, she had her face lifted.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

C. C. YOUNG.....Governor

B. B. MEEK.....Director

CORNING DE SAULES.....Deputy Director

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CALIFORNIA HIGHWAY COMMISSION

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J. P. BAUMGARTNER, Commissioner, Santa Ana
M. B. HARRIS, Commissioner, Patterson Bldg., Fresno
JOSEPH M. SCHENCK, Commissioner, c/o United Artists Studio, Santa Monica Blvd., Los Angeles
FRED S. MOODY, Commissioner, 640 Kohl Bldg., San Francisco

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GEORGE C. MANSFIELD, Secretary

HARRY A. ENCELL, Attorney, San Francisco

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T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Chief Accountant

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F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

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A. D. EDMONSTON, Deputy in Charge Water
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R. L. JONES, Deputy in Charge Flood Control and
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GORDON ZANDER, Adjudication, Water Distribution

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CARLETON PIERSON, Specification Writer

C. O. PALM, Chief Clerk

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J. W. DUTTON, General Superintendent Construction

W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

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California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

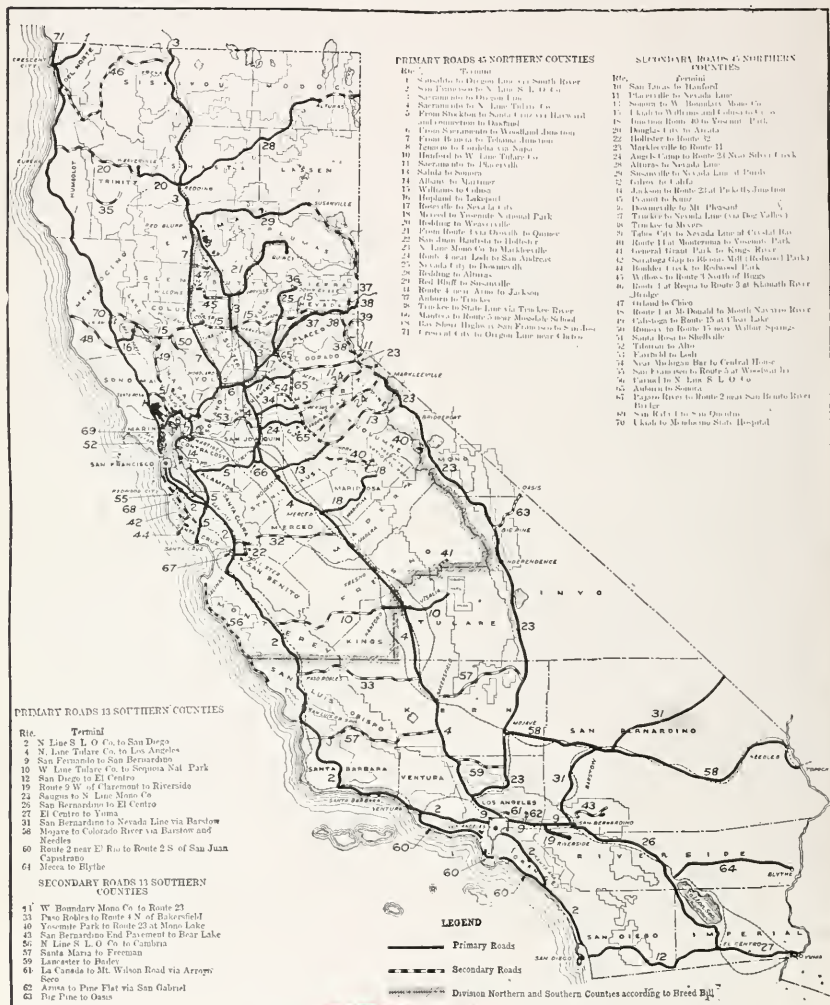
DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor

Port of San Jose—Not appointed

Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



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California Highways and Public Works



IN THE YOSEMITE VALLEY

Official Journal of the Department of Public Works
JULY-AUG. State of California 1930

A Report on State Highways

By B. B. MEEK, Director of the Department of Public Works

ON June 30, 1930, the first year of the second biennium (extending from July 1, 1929, to June 30, 1931) of the present state highway administration came to its close. The time seems opportune to make a report on the progress of state highway affairs.

Since January 1, 1927, contracts have been let for major improvements upon over 2100 miles of the State highway system. The program has been by far the largest in the history of the State highway system. Counties and communities have been and are rapidly being given the highways that their development requires.

The one-cent gasoline tax for new highway construction has more than justified itself. Since May 26, 1927, when Governor Young signed this measure, 652 miles of entirely new highway have been built from funds provided by it.

OVERHEAD COSTS REDUCED

Overhead costs have been progressively reduced from 5 per cent when the present administration took charge of affairs to 3 per cent.

HIGHWAY PROGRAM ADVANCED TO MEET EMPLOYMENT NEED

Just how immediate has been the response of the State of California to the needs of public work in a period of depression is evidenced by the fact that on July 16, 1930, 80 per cent of the state's highway program for the present biennium (with eleven months of the biennium yet to come) is either completed, under contract or now being advertised for bids.

The care that has been exercised to secure the equitable distribution of these funds is shown by the fact that this figure represents 80 per cent of the budget allotment for work in the southern counties and 80 per cent in the northern counties.

BUDGET SYSTEM CREATES RESERVOIR OF PROJECTS

Through the carefully planned-in-advance building program that follows as a necessary result of the budget system, engineering on highway projects, both in the field and office, has been carried sufficiently ahead of actual

construction that a reservoir of available highway projects was created, which has been heavily drawn upon to assist both in the relief of unemployment and to better marketing conditions for materials and supplies needed in highway work.

PLANNING SYSTEM EXTENDED TO TEN YEARS

The benefit derived from planning highway work in two-year periods has been so thoroughly established that the California Highway Commission and the Department of Public Works are now compiling a report based upon a study of the probable traffic needs of California for a ten-year period. This study will prove of inestimable value to those in charge of administering state highway affairs, and should save the people of the state many millions of dollars in the ultimate cost of the state system.

SAFETY BEING BUILT INTO STATE HIGHWAYS

No state in the Union has a more ambitious program for building safety into its roads than is found in the California highways now being built or brought up to modern standards of alignment, design and construction.

Dangerous railroad grade crossings are being progressively eliminated at a rate which promises in a very few years to entirely free the state highway system of railroad grade crossings.

THREE CONTRIBUTIONS TO HIGHWAY POLICIES

It may be of interest to note that the four years that will close with the end of the present calendar year have seen three outstanding contributions to the administration of state highway affairs. These may be summarized as follows:

First, the resumption of new construction on the state highway system through the adoption of the one-cent gasoline tax measure;

Second, the application of the budget system to state highway expenditures, through which the public is informed of the manner in which it is proposed to spend state highway money in advance of and not after such expenditure;

Third, the adoption for the first time of a definite and orderly policy to govern extensions to the state highway system.

Synopsis of Report on Orderly Additions to State Highway System

Made to Governor C. C. Young in accordance with Assembly Concurrent Resolution No. 16, relative to the orderly addition of new roads to the state highway system, after engineering and economic studies by the California Highway Commission and the Department of Public Works.

Recommendation for the inclusion of twenty-two additional highways into the state highway system were made to Governor C. C. Young on July 24th by B. B. Meek, Director of the Department of Public Works, and the members of the California Highway Commission.

The report follows a fifteen months study of proposed extensions to the state highway system, a study ordered by the last legislature in a joint resolution of the Senate and the Assembly, unanimously adopted by both houses. This resolution directed that the report should be completed and transmitted to the Governor by August 1st.

Under the terms of the joint legislative resolution, all new highways recommended for inclusion in the state system were confined to roads that could qualify in at least one of three classes. These classes were:

1. Roads now carrying a large volume of state traffic;
2. Roads affording relief to heavy traffic on present state highways;
3. Roads serving as important interstate highway connections.

The legislative resolution also directed that the additional mileage recommended for inclusion in the state system should be limited to from 10 to 12 per cent of the 6590 miles now in the state system. It further directed the progressive equalization of the existing disparity in secondary highway mileage between the northern and southern counties (secondary highway mileage of the north is 1778 miles and that of the south 525 miles) by the addition of not less than three or four miles in the south to one mile in the north, without change, however, in the present equal allocation of secondary highway money as between the north and the south.

Under the rules laid down by the legislature, Director Meek and the California Highway Commission have recommended the inclusion of 804 miles of roads into the state system. This constitutes 12 per cent of the present state highway mileage. The mandate of the legislature relative to the distribution of these roads is also followed in that the ratio of mileage is 3.7 miles in the south to one mile in the north.

Governor Young stated today that he would recommend to the coming legislature that the report be adopted by that body. Ralph W. Bull, chairman of the California Highway Commission, stated on behalf of that body, that the California Highway Commission would avail itself of the right, granted to it by the legislative resolution, to include in the highway budget now being prepared provision for the betterment of the roads recommended for inclusion in the state system.

The roads that this report recommends that the coming legislature include in the state highway system are as follows:

IMPORTANT INTERSTATE CONNECTIONS

1. *Mecca-Blythe Highway connections.* (a) To the Arizona state line. The present state highway terminates at Blythe, 4 miles from the Arizona line. It is proposed to include this section in the state system, thus establishing a connection with the Arizona state highway system at the Colorado river. This project lies in Riverside County.

(b) Western terminus of present road to San Bernardino-El Centro Highway. The western end of this road also was without connection with the state highway system. It is recommended that 19.5 miles be added to the system connecting this road on the west with the San Bernardino-El Centro highway. This section lies in Riverside County.

2. *From a point on the present state highway near El Centro to Calexico on the Mexican border.* The northern terminus of this road is near the junction of three state highway routes and lies in the center of the intensely cultivated Imperial Valley Irrigation District. The southern terminus is an important

entrance from California to Mexico. The length of the road is 8.5 miles, all in Imperial County.

3. *Oasis to the Nevada state line.* The state highway (Route 63) from Big Pine to Oasis was added to the state system in the \$40,000,000 highway bond act. Terminating the route at Oasis, 2½ miles short of the state line, was obviously an oversight as the road was intended to afford a connection between the California highway system and that of Nevada. The addition of this section to the state system affords the desired connection and corrects an obvious error. The mileage lies in Mono County.

4. *National City to the United States-Mexico international boundary.* There is no state highway south of San Diego to the international boundary. The traffic between these points, a large percentage of which is state and international in character, is carried over a county road. It is believed that the international connection on the California side should be a state highway. The road down the Mexican coast now extends far, and will undoubtedly be continued much farther. The road classifies for inclusion both on its volume of state traffic and as an international road connection of importance. The length is 10 miles, all in San Diego County.

5. *Bishop to the Nevada state line via Montgomery Pass.* This road is of importance as an interstate connection which utilizes a mountain pass, the superiority of which has been established both by studies of the California and the Nevada state highway commissions. During the winter months it is the most direct winter route between southern California and Nevada. Nevada has been awaiting action by California in making a permanent adoption of the route before undertaking any large program of improvement on its side of the line. The road is 38 miles in length and lies in Inyo and Mono counties.

6. *Alturas to the Oregon line.* This road will connect the California state highway system with an improved highway built by Oregon to the California state line at New Pine Creek. It affords the only state highway connection between California and eastern Oregon. The road will constitute a link in the Yellowstone cut-off and will serve through its connections the various recreational highways in north-eastern California. The road lies in Modoc County and is 34 miles in length.

7. *Quincy to the Nevada state line.* This road forms a connection between the Feather River lateral and the Nevada state highway system. Without this connection full utilization can not be had of the all-year road up the Feather River. The highway from Quincy to Beckwith is being built from U. S. Forest funds and is nearing completion.

Lack of county funds will prevent further improvement between Beckwith and the Nevada state line. The length of the road is 58 miles. It lies in Plumas and Lassen counties.

8. *A connection from the Pacific Highway near Weed to the Oregon state line.* This route forms a connection between the Pacific Highway in California and improved Oregon roads which pass through Klamath Falls and points north thereof. The road classifies for state inclusion as an interstate connection of commercial and recreational importance and as an advantageous alternative and relief highway to the northern part of the state. It is now being built as a joint highway district. The road lies in Siskiyou County.

HIGHWAYS NOW CARRYING A LARGE VOLUME OF STATE TRAFFIC

1. *American Canyon Highway.* This road will make a state connection from the Sacramento, Yuba, Napa and Suisun Valley state highway near Cordelia

to state highway Route 14 in Contra Costa County. Traffic at present takes the county road through Vallejo to Napa junction. This latter road is 5 miles longer than the proposed route and has many railway crossings which will be eliminated by the relocation. The proposed road qualifies for state inclusion because it will be the logical routing supplanting a county highway which now carries a very large percentage of state traffic. The road is 14 miles in length and lies in Solano, Napa and Contra Costa counties.

2. *Walnut Creek to Oakland.* Alameda and Contra Costa counties have organized a joint highway district for the construction of a public highway and tunnel to supersede the present inadequate tunnel road in Alameda County and improve the Contra Costa County road from the tunnel to Walnut Creek. Travel on the present road shows less than 5 per cent local traffic. With the completion of the new tunnel the percentage of local travel to the total volume will be even less. It is proposed that the state take over the portion of this project which lies in Contra Costa County between the tunnel and Walnut Creek, a distance of 9.6 miles.

3. *A highway from Los Angeles to a connection with the San Bernardino-El Centro state highway near Colton.* This route is one of the intermediate routes in the territory bounded on the west by Los Angeles and on the east by San Bernardino and Riverside counties. It follows, in large part, county roads exceptionally well located. Traffic studies plainly show that the character of the travel is such that the importance of including it in the state system is self-evident. The length of this highway is 42.5 miles. The road lies in Los Angeles and San Bernardino counties.

4. *The Jack Rabbit Trail.* The county highway between Riverside and Beaumont, commonly referred to as the Jack Rabbit Trail, is used by many as a short cut between state highways. State traffic now constitutes 69 per cent of the travel on the road. The road is 19.5 miles long and is situated in Riverside County.

5. *Riverside to San Diego (Inland Route).* The Inland Route from Riverside to San Diego is an old established county routing. Riverside and San Diego counties have paved this route, making a serviceable road for light travel. Traffic counts show a very high percentage of state traffic on this highway. Its length is 95 miles, all in Riverside and San Diego counties.

6. *Pomona to Temecula.* The general course of this route shows that it establishes a very direct cut to the Elsinore Lake district and to the Inland Route from the Pomona territory. Traffic count shows that state traffic on this route runs as high as 82 per cent. It qualifies for inclusion in the state system both by reason of its present large state traffic and because of the relief that it would afford to the Coast Route. The road is 56 miles in length and is situated in Los Angeles and Riverside counties.

7. *Cambria to San Luis Obispo.* This road affords a connection between the Coast Route at San Luis Obispo and the Carmel-San Simeon highway at Cambria. The present connection between these two highways is a county road. The completion of the Carmel-San Simeon highway will throw a large volume of state traffic over this road and for this reason the inclusion of this connecting link between two state highways is recommended. The road is 36 miles in length and lies in San Luis Obispo County.

8. *Pomona to the Coast Highway near Fullerton via Brea Canyon.* This road is an established short cut between the territory east of Los Angeles and the beaches and area south of that city, and ultimately will provide a desirable route for truck traffic to the coast. Through traffic now predominates on the road, intercounty and state traffic constituting about 76 per

(Continued on page 27.)

Protection Against the Forces of Nature in California Highway Construction

By C. S. POPE, Construction Engineer, California Division of Highways *

THIS paper deals with some of the more unusual elements from which it is necessary to protect highways in the western states such as floods, cloud-bursts, sea waves, moving sand dunes, and earthquakes.

FLOODS

Floods may be of the type caused by the normal rise of large rivers due to rainfall or by sudden floods in normally dry streams due to cloud-bursts or heavy rainfall. In either case, the protection of highways against destruction is an important problem.

Some of the methods of protection which have been developed in this state include the construction of brush and wire fences, mats composed of wire mesh and gravel, deflecting



Deflecting jetty made of piling.

WAVE ACTION

Protective structures for sea waves take the form of booms anchored to piles, heavy random riprap, hand placed riprap, sheet piling of wood or concrete or other bulkheads, groynes of wood or steel, jetties, wave breakers, and slope paving, and sea walls.

SAND DUNES

Protection against moving dunes is generally obtained by a study of their habits and movements. Some may be avoided by a change of location, others by a raise of grade, and others may be removed by wind action or with the use of equipment.

EARTHQUAKES

So far as we have observed, there is no known cure for earthquakes except good construction which includes the use of a suitable number of expansion joints in concrete paving, the clearing of all hillsides of hanging



Slope paving and masonry walls.

jetties of stone or piling, and wire mesh, deflecting tetrahedrons of steel or reinforced concrete, sacked concrete riprap, hand laid stone riprap, random riprap, stone filled wire baskets, and slope paving.

CLOUD-BURSTS

Protective structures against cloud-bursts may consist either of a system of dips in pavements providing overflow over aprons and cut-off walls, or may be provided by a system of channels and deflecting dykes designed to pick up the broad but heavy flow occasioned by cloud-bursts and conducting the same through channels over which trestles have been constructed.



Protecting banks by brush and wire fence.

* A paper delivered before the American Society of Civil Engineers at its spring meeting in Sacramento.



Concrete cells.

rock, and solid construction of all fills in earthquake country.

FLOODS

Since a great many of our more destructive floods occur in arid regions and are accompanied by the transportation of considerable amounts of sand which not only prevent solid structures from being used but make them useless for the reason that stream beds are filled up and changed, there has been considerable use of structures of a type which are easily replaced.

BRUSH AND WIRE FENCING

A popular type of protection is the brush and wire fence dyke, which is constructed of two rows of galvanized iron pipe on which wire or fencing is fixed to retain the brush filler which is placed between the rows of fencing. The brush is weighted down with stones to insure its settlement into any washouts which might occur. There has been developed a very definite system of installation of this type of fencing.

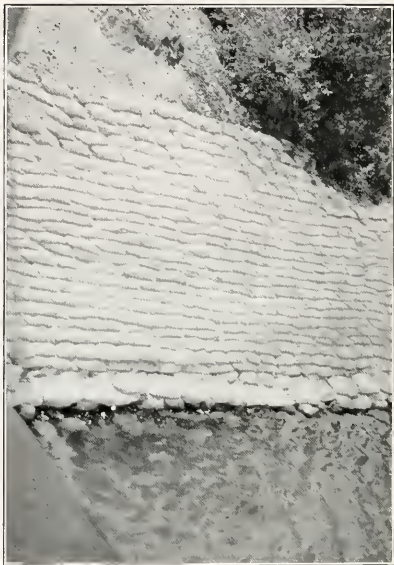
STONE FILLED WIRE MATS

A second common practice is the construction of slope mats of wire mesh and cobbles. The slope is first dressed to an even surface and on it is laid a section of wire mesh. A

coating of cobbles 6 or 8 inches thick is laid on the wire mesh and a second wire mesh panel is wired down on top of the cobbles. This construction gives a flexible mat which will, to a certain extent, follow any undulations which may occur due to washouts. It has been extensively used in storm protection work in Los Angeles County, but not to any great extent by the highway organization.

JETTIES

Deflecting jetties constructed of piles with wire mesh nailed to them were at one time considered the most satisfactory type of stream protection, but, at the present time,



Sacked concrete.



Tetrahedrons that saved the highway in the St. Francis flood.

their use is confined largely to the northern part of the state where the character of the stream bed is usually more stable than is found in the south. When properly constructed, they prevent bank erosion and are of considerable value.

TETRAHEDRONS

Where the character of the detritus carried by the stream is rather light, such as the Colorado River silt or fine sand, the use of skeleton tetrahedrons of steel or concrete has been found very effective for stream deflection. These tetrahedrons are placed in line

at the location where bank erosion is taking place, completely closing the break, and they are usually anchored with cables to insure their being maintained in position. Their function is to interrupt the flow of the stream in such a manner as to cause silt to deposit in the eddies set up by the obstruction, and their use has been followed by very successful results in many locations. Those used on the Colorado River by private interests were constructed from steel rails 30 feet in length and were used successfully in deflecting this



Wind channels cut in sand dunes.

large stream where other means had not been successful.

On highway work a row of tetrahedrons which had been placed to deflect the stream on the Santa Clara River was the means of saving a considerable section of highway during the St. Francis dam disaster.

SACKED CONCRETE

In locations where large rock was not available, the state has used a considerable amount of sacked concrete placed as riprap in critical locations.

STONE FILLED STEEL BASKETS

In somewhat the same territory, we have also installed, under plans made by the Bureau of Public Roads, metal baskets having a volume of about $1\frac{1}{2}$ to $2\frac{1}{2}$ cubic yards which were filled with stone and placed by means of suitable equipment as bank protection.

SLOPE PAVING

Slope paving has been extensively constructed either by hand placing suitable stone or by constructing slope walls of concrete 4 inches to 6 inches in thickness which extended a sufficient depth below stream bed to be safe. On many streams the use of random riprap of considerable weight has been advantageous as a method of protection.

CLOUD-BURSTS

One of the most unusual problems we have

to face is the protection against cloud-bursts. Without having complete data on the subject, it is nevertheless the opinion of some of our engineers that these cloud-bursts occur in approximately the same areas within a reasonable range. Since in many localities the hills and mountains are entirely denuded of any verdure which would retard the flow of water the volumes of water to be handled are very large and the run-off very rapid. The water often appears without previous intimation that a cloud-burst had occurred. The first knowledge which the observer has of the approaching danger is the appearance of a wall of water and mud sweeping down the canyon. The method pursued in the past has been to construct paved dips across all locations where the profile indicated that cloud-burst run-offs were usual. This, however, proved unsatisfactory in many cases because of extreme scour which occurred at the over-flow aprons. It seemed practically impossible to check the velocity of the water either by cut-off walls or water cushions.

DEBRIS CONES

The usual formation in sections where cloud-bursts are frequent show the presence of flat debris cones issuing from the canyons or other sources from which the water comes and spreading out fan-wise into the lower lands.



Dykes to protect desert roads.

Taking advantage of this condition, the state has adopted the system formerly used by the Santa Fe Railway in constructing pick-up channels or dykes along the line of the cones in such a manner as to secure greater velocity in the channels than is afforded by the general slope of the country. The channels, of course, must be located close enough to the highway to intercept any considerable amounts of water. The results so far obtained have been extremely satisfactory in restraining all of the water from crossing the highways except at certain designated points, where wooden

(Continued on page 24.)

Receiving Tourists to California

By P. T. POAGE, Assistant Architect

FOR MANY years the State of California, through its Department of Agriculture, has watched and studied the effect of plant pests in other states and in foreign countries. To prevent the disastrous inroad of such pests as the Cotton Boll Weevil, the Mediterranean Fruit Fly, and the Alfalfa Weevil, into this state, a careful quarantine service has been maintained with inspection

stations at all entrances into the state. Millions of dollars are being saved annually through the prevention of such catastrophes as the recent fruit fly epidemic in Florida. Shortly after taking office, Governor Young recognized that the state had both an opportunity

and an obligation to fulfill in this service—an opportunity to create in the mind of the incoming stranger a favorable first impression of California; an obligation to treat the tourist with the utmost courtesy, by explaining carefully the reason for the inspection, and by making the inspection courteously with entire absence of arbitrary authority.

It was apparent that the desired type of service could not be given without more adequate facilities. Thus, at Fort Yuma, California (sometimes known as Winterhaven) immediately across the Colorado River west of Yuma, Arizona, we find, now under construction, the first of California's "Super-Service Stations." This station is being constructed jointly by the Department of Agriculture and the Division of Motor Vehicles, so that in addition to the quarantine inspection, registration of automobiles bearing licenses from other states will be handled, and a general information service will be made available to the traveler.

The selection of a site is of prime importance. No side road which would permit bypassing the station may be permitted to intersect the main highway between the station and the border. At Fort Yuma this has forced the selection of a restricted and difficult site requiring heavy cut and fill, and all but crowding onto the state highway right of way. Nevertheless, when completed there will be adequate room for parking and for handling all of the traffic which may be expected for some time to come.

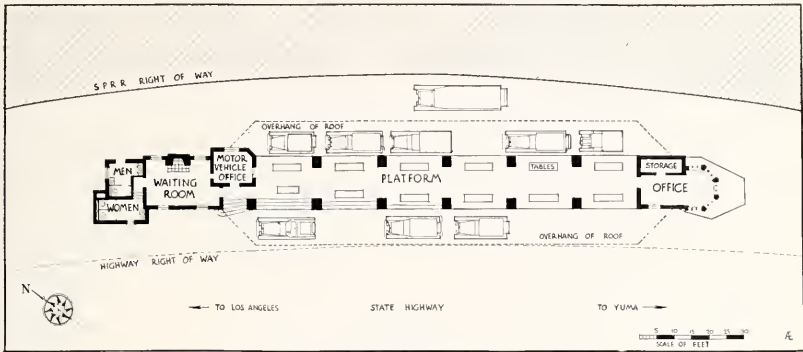
The building will be long and low, reminiscent of the desert in which it is located. At the east end the horizontal feeling is broken by a tower forming an accent to attract the attention of the motorist. Under the tower is located the office of the agricultural inspectors arranged with windows giving full view of the highway in the direction of the border. This office opens onto a long concrete platform which will accommodate twelve cars lined up on the two sides. A wide tile road



P. T. POAGE



General view of State Plant Quarantine Inspection Station at Fort Yuma.



Layout of Border Station at Fort Yuma.

supported on steel trusses covers the platform and extends entirely over the cars on either side so that inspection may be carried on in the shade.

At the west end of the platform are quarters for the Motor Vehicle offices, a rest room for the public, and comfort stations for men and women. The rest room has a fireplace on one side and will afford a homelike comfort to the weary tourist while waiting for inspection.

The building walls will be of hollow cement brick, whitewashed to resemble the native adobe brick. The roofs will be covered with an insulating material, which, with the hollow walls will afford a maximum of comfort on the warm summer days of the desert.

Ice cold drinking water will be provided by an electrical refrigerating unit, conveniently located on the platform.

The construction of this station is a major step in the program for a gradual improvement of all border stations. When completed, this summer, California will be able to extend to its guests a real "Super-Service."

WELL, WHY NOT?

Identity of the young lady is withheld, but the memory of her answer lingers on with the instructor conducting a science course at a high school. One of the requirements in the written quiz was: "Define a bolt and nut and explain the difference, if any." The girl wrote:

"A bolt is a thing like a stick of hard metal such as iron with a square bunch at one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite, being a hole in a little chunk of iron sawed off short, with wrinkles around the inside of the hole."

The startled professor marked that one with a large "A."

State Shows Big Increase in Auto Registrations

Additional evidence that California is the "white spot" of America in business was given in figures compiled by the Division of Motor Vehicles showing that motor vehicle registrations in the state gained more than 6 per cent during the first five months of 1930 over the same period for the previous year.

The net gain in vehicles was 110,828, the total in fee-paid registrations for the five-months period being 1,937,535, as compared with 1,826,707 for the previous year.

The division expects to equal the total for 1929 early in July when registration of many vehicles, held back for various reasons, will have been made.

At the present rate, the percentage of increase for 1930 over 1929 will be far greater than 1929 over 1928.

The gain in passenger cars for the five-month period was 95,071.

Registrations for the five-month period ending May 31st were reported as follows: Passenger cars, 1,804,331; solid tire trucks, 14,322; pneumatic tire trucks, 71,781; solid tire trailers, 8635; pneumatic tire trailers, 30,630; motoreycles, 7836.

Registration fees collected by the division for the period totaled \$8,620,756.

INSTALLMENT PLAN

Young Man—How much do I pay for a marriage license?

Clerk—Five dollars down and your entire salary each week for the rest of your life.

The Golden State Highway

By E. E. WALLACE, District Engineer *

THE PORTION of the California state highway between Los Angeles and Sacramento which traverses the central portion of the state and which is designated as U. S. Route No. 99, is popularly known as the "Golden State Highway."

This is the main artery for all central California travel and is supplemented by more than a dozen main laterals connecting with the centers of population and with various recreational areas, including three national parks. It traverses the San Joaquin and a portion of the Sacramento valleys, providing access to hundreds of thousands of acres of intensively irrigated and cultivated lands, and to vast oil fields. The valley produces great tonnages of supplies, considerable portions of which are hauled over this highway. New recreational territories are being opened in the Sierra region. The Kings River Canyon Highway is one of the larger projects of this kind.

The development of the "Golden State Highway" has been an interesting and important part of the growth of California.

To the early Spaniards and pioneers this was then the Great Interior Desert of California and because of its vastness and lack of transportation facilities, it was a thing to be avoided.

The first settlement of consequence was established at Visalia about 1835. Later, because of the discovery of gold in the Mother Lode country, numerous settlements developed along the pony express trail, which had been located in the foothill country on the easterly side of the valley in order to avoid the overflow lands farther to the west.

With the rush for gold and the accompanying development of agriculture and industries, the Fremont Trail was the next traffic development. This trail connected many of the old mining towns on the Mother Lode and gradually extended to other new developments.

A railroad was then built through the center of this great valley. Wagon roads were constructed paralleling the tracks and crossing them frequently and these same roads



Golden State Highway south of Bakersfield.

were the beginning of the present "Golden State Highway."

The automobile gradually displaced the horsedrawn vehicles and with this displacement the demand for better highways has grown more rapidly than finances could be provided.

These wagon roads were gradually widened and surfaced but the use of the automobile developed even more rapidly than the highways. It is of interest to note some traffic census figures which were taken in the vicinity of Fresno during 1913 in comparison with our traffic count at the same location last July.

Year	Horse drawn vehicles	Automobiles	Trucks
1923-----	657	451	21
1929-----	2	7978	727

Such development demands wider rights of way, higher standards of alignment, elimi-



Old store at Tattletown, said to have been patronized by Mark Twain. This is on the Mother Lode Highway, which is served by the Golden State Highway.

* Between Sacramento and Turlock, the Golden State Highway lies in District Ten, R. E. Pierce, District Engineer; between Turlock and Lebec in District Six, E. E. Wallace, District Engineer; and between Lebec and Los Angeles in District Seven, S. V. Cortelyou, District Engineer. Data relative to the Golden State Highway in Districts Seven and Ten was furnished Mr. Wallace by District Engineers Pierce and Cortelyou.



Subway at Califa in Merced County.

nation of railroad grade crossings, more substantial structures and much more modern types of pavement.

By concentrating all available finances on U. S. Highway No. 99, the State Highway Commission has accomplished much towards providing a modern highway which is adequately handling the traffic, but on which much is yet to be done in order to keep pace with the rapidly increasing traffic.

The original pavement on this route was only 15 feet wide and 4 inches thick. This has been resurfaced and widened to at least 20 feet until at the present time only about 30 miles out of the original 360 remain of the old narrow pavement.

FROM SACRAMENTO TO TURLOCK

The Golden State Highway from Sacramento to Turlock is the main north and south artery through the valley from which branch roads lead to the historic Mother Lode region and the famed recreational areas of the Sierra Nevada Mountains. At Salida the Sonora lateral leaves the Golden State Highway and



New trestle over Cosumnes overflow in Sacramento County.

about 10 miles west of Sonora the scenic Big Oak Flat road branches off reaching Yosemite Valley from the north and tying into the Tioga road, which lateral crosses the Sierra Nevada over Tioga Pass at an elevation of 10,000 feet.

The Sonora lateral meets the historic Mother Lode Highway at Sonora and continues through heavily forested country of great scenic interest and finally crosses the summit through Sonora Pass at an elevation of 9624 feet.

At Lodi the San Andreas lateral reaches the Golden State Highway and connects with the Mother Lode Highway at San Andreas, being the route through the historic Angels Camp and continues to the Calaveras Big Trees, over the Sierra Nevada at Ebbetts Pass and into the scenic Alpine County.

North of Galt at Twin City the Jackson lateral leaves the Golden State Highway,



Bridal Veil Falls in the Yosemite Valley.

crosses the Mother Lode Highway at Jackson and continues past Silver Lake and Carson Pass. It crosses Carson Pass, which is famed as the point where Fremont crossed the mountains under the guidance of Kit Carson during the winter of 1844, and thence continues into Alpine County. The Mother Lode Highway extends from Auburn to Sonora and passes through many historic places such as Plymouth, Drytown, Amador City, Center Creek, Jackson, Mokelumne Hill, San Andreas, Angels Camp, Jack Ass Hill (made famous by Mark Twain's book "Roughing It"), Tuttletown and Sonora.

During the past few years many improvements have been made on the Golden State Highway, both in the matter of resurfacing, widening, and in the improvement of alignment. Between Manteca and Stockton the original route via French Camp was relinquished to the county, the state taking over a new route via Hogan and Mariposa roads. Considerable mileage of Portland cement

concrete paving, both north and south of Stockton, is planned for the next biennium work. Four concrete bridges are now under construction and approximately seven miles of concrete pavement in this vicinity.

North of Lodi contracts have been awarded for bridge and approaches to the Mokelumne River. In the vicinity of Arno, between Stockton and Sacramento, a line change eliminated a very poor portion of county road location. This is scheduled for cement concrete paving.

By July 1, 1933, it is expected that the entire Golden State Highway between Sacramento and Turlock will be widened and paved with a high standard 20-foot pavement.

FROM TURLOCK TO LEBEC

Between Turlock and Lebec the Golden State Highway is the main north and south artery through the San Joaquin Valley. There are numerous connecting laterals which lead to national parks in the high Sierras to the east and over the Coast Range and join the coast route on the west. Route 18, the Yosemite lateral, leaves the Golden State



Grading operations on the Newhall alternate line.

Highway at Merced and continues easterly and northerly via Mariposa and the Merced River Canyon. The Pacheco Pass lateral intersects the Golden State Highway at Califa and provides the most direct connection from the central San Joaquin Valley to coast points. At Fresno a county road leading easterly to General Grant Park forms the connection with State Highway Route 41, which is now being constructed as a future route into the Kings River Canyon.

The Sierra-to-Sea lateral crosses the Golden State Highway about one mile south of Goshen Junction. It connects with the coast route on the west and leads to Sequoia National Park on the east.

Route 33 provides a coast connection at Famoso, being a point on the Golden State Highway about 20 miles north of Bakersfield.



Highway tree planting in Stanislaus County.

At Bakersfield the Golden State Highway connects with Route 57, which proceeds easterly through the Kern River Canyon, crossing Walker Pass and intersecting the highway east of the Sierra Nevadas at Freeman, a point north of Mojave. About 20 miles south of Bakersfield, Route 57 leads westerly, passing a short distance north of Wheeler Ridge and leading to the oil fields and westerly through Maricopa, over Cholame Pass, to connect with the coast route.

RECENT IMPROVEMENTS

The Golden State Highway is rapidly being improved to a much higher standard than the old 15-foot by 4-inch concrete pavement of which only 30 miles now remain between Turlock and Lebec. The outstanding recent improvements include a 20-foot cement concrete and 20-foot asphaltic concrete paving between Berenda and the north line of Madera County, the cost of which, including the Califa subway, was approximately \$350,000. Two railroad grade crossings were eliminated in this improvement by locating west of the Southern Pacific and constructing a combined underpass for Routes 4 and 32 at Califa.

(Continued on page 28.)



Line change on present Ridge Route.

Brake Testing Activities

By ANDREW J. FORD, Inspector at Large, in Charge of Bureau of Brakes and Commercial Vehicles

BRAKE testing has become a part of the regular weekly duty of members of the California Highway Patrol and is proceeding in an orderly manner all over the state.

Thus far the campaign has not gone far beyond the "courtesy" stage. It is rapidly reaching the point, however, where actual citations will be issued to motorists whose brakes can not comply with the standards set up by the motor vehicle act.



ANDREW J. FORD.

During the last three months officers have stopped approximately 85,000 cars and examined the brakes. Of these between 10 and 12 per cent were found to be driving with brakes that did not meet the requirements of the law.

This does not represent the actual percentage of poor brakes among all cars operating inasmuch as the officers only stopped a small percentage of the cars on the roads to test their brakes in order to avoid holding up traffic. It is believed that the actual percentage of all the cars operating on the road is much less.

The brake testing campaign has been conducted without any lessening of other activities of the patrol. In most of the counties it has been the custom to set aside certain hours in the week to devote to this work.

The public has shown a marked appreciation of the need of good brakes and has cooperated well. Many have come to the patrol voluntarily and requested that their brakes be examined. Motorists stopped along the highways for the purpose of checking their brakes have, almost without exception, submitted to the tests without grumbling and have been courteous to the officers. Great care has been taken to impress the motorist that good brakes are necessary for his own

safety. Officers have taken care also to impress him with the fact that the state authorities do not care where he has his brakes repaired provided, that after the adjustments are made, the brakes will test up to the requirements of the law.

Along with the actual field work of inspecting brakes has gone the work of checking applications received from all parts of the state for designation as official brake testing stations.

Considerable misinformation was disseminated regarding the state's attitude on this matter which was corrected before the work progressed far. Among other things, the patrol administration has sought to impress the public that it is not recommending, suggesting or prohibiting any type of brake testing or adjusting machine or equipment and has no interest in the various persons who have applied for such designation except to see that they are honest and competent.

In designating such testing stations, the patrol has kept in mind the reputation of the applicant as a business man, the ability of the men employed to do the adjusting, the location of the garage, shop or service station, the demand for such stations in the community and similar qualifications.

Approximately 900 establishments have been designated as official stations to date. These designations were made after a careful personal check by the patrol. Approximately 2000 mechanics have been authorized as adjusters.

In carrying on our brake testing program, emphasis is being laid on the fact that the motorist is not required to have a brake certificate to drive a motor vehicle. It is only after his brakes have been tested and found not to comply with the law that he is required to have his brakes adjusted or repaired and to produce evidence that he has done so.

A motorist who has been cited for defective brakes may secure adjustment at an official brake testing station. He will receive from that station a certificate which he can mail with his citation card to the patrol officer in order to clear his record. If the motorist has his brake adjustment work done at a place other than an official brake testing station, he may satisfy the citation by appearing

(Continued on page 29.)

Important Progress on East Bay Highway

COLONEL JNO. H. SKEGGS, District Engineer

THAT section of state highway between Oakland and San Jose officially designated as State Highway, Route 5, was originally a county road known as the "Mountain road." With its adoption into the state highway system it has gradually assumed the importance to Oakland, San Jose and east bay territory which the Peninsula Highway bears to San Francisco, San Jose and peninsula territory.

The first improvements by the state on this important section of highway were made in 1915, at which time the standard from Hayward to San Jose was an 18-foot width pavement on a 24- to 30-foot graded roadway. The 5-mile section between Oakland city limits and Hayward was taken over by the state from the county already paved 24 feet wide.

By 1924 this highway had assumed such importance that a general program of widening and reconstruction to conform to the rapidly increasing traffic demands of the time, was adopted. Under this widening program the 3.8 miles between Milpitas and Coyote Creek was constructed that year.

In 1928 the 4.3-mile section between Warm Spring and Milpitas was widened in like manner to 30-foot paved width.

The most recent section of this major plan, the 8.7 miles between Hayward and Niles was completed in May of this year. This project called for widening the present right of way from its former width of 40 to 60 feet to a full 100-foot width throughout. Owing to the heavy urban settlements south of Hayward, where the property for 2 miles on both sides had been subdivided into city lots, right of way negotiations call for not only the purchase of highway frontage property, but included much construction in moving and rehabilitating the many residences and light commercial buildings involved. The balance of this section skirts the cultivated hills on the east with an intensively farmed valley floor, extending west to the bay. Right of way problems consisted of some 215 property negotiations in addition to moving and reconstructing about 80 buildings.

Three line changes were made on this section, one of which was more in the nature of a shift made necessary to avoid encroaching upon Holy Sepulchre Cemetery in widening right of way. A second line change bettered

alignment for approximately one quarter of a mile, and was more or less determined by right of way controls. The most important change was that made in the approach from the north to the Niles underpass, where a practically blind reverse curve entrance was eliminated.

Construction consisted of widening, in general on the east side only with an 11-foot width of 8-inch to 10-inch thickness of concrete, and resurfacing the old original 18-foot concrete pavement and 1 foot of the new concrete with a minimum thickness of 3 inches of asphalt concrete. On line changes or slight grade changes three 10-foot strips of 8-inch to 10-inch thickness of concrete were placed. However, where line change involved widening to variable width, 7-inch to 9-inch concrete was placed and 3-inch minimum thickness asphalt concrete 30-foot width or more to cover old and new concrete.

The project thus involved approximately $1\frac{1}{2}$ miles full width surfaced with asphalt concrete, including one-half mile through the business portion of Niles, $1\frac{1}{2}$ miles of 30-foot width concrete, and 6.1 miles of surfacing existing pavement with asphalt concrete and widening on the east with Portland cement concrete. Graded roadbed width is 47 feet with 6-foot shoulder on the east and 11- to 12-foot shoulder on the west preparatory to widening on that side in the future to an ultimate 40-foot paved width centering the 100-foot right of way.

The completion of this project is another step in the progress of the major plan of widening and resurfacing upon the best economic engineering alignment possible between Oakland and San Jose. Not only is this consistent with the traffic demands of this rapidly developing east bay territory, but design has been made with a vision of future construction requirements. Increased visibility has been secured at all intersecting roads and driveways, for this is a fast highway. The wide west shoulder gives the effect of a four-lane highway tending to diminish traffic hazards.

This section of highway holds a particularly important position with respect to east bay communities due to the excellently paved connections at many points leading to both the transbay bridges. Northbound travel is

(Continued on page 23.)

Salvaging Water Waste in the Los Angeles Coastal Basin

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THE state-wide water resources investigation authorized by the 1929 legislature is being vigorously pressed through the cooperative efforts of three state and federal agencies, namely, Hoover-Young Commission on California Water Resources, Joint Legislative Water Resources Committee, and the Department of Public Works. Comprehensive engineering investigations are under way in nearly all sections of the state as follows:

One phase of the investigation of particular importance has to do with salvaging present water waste in the South Coastal basin of Los Angeles. This basin occupies an area 90 miles from west to east at its greatest length and 50 miles north and south at its greatest width. It contains 57 incorporated cities, numerous urban communities not incorporated and 2200 square miles of irrigable land or land suitable for residential development. About 2,800,000 people live in this basin or 50 per cent of the population of the state, although the area is less than one and four-tenths per cent of the total area of the state and only seven-tenths of one per cent of the water supply is found here. Population and irrigated area are rapidly increasing.

It should be noted that only seven-tenths of one per cent of the water supplies of the state are found in this region. To amplify the local supply, the City of Los Angeles has constructed its aqueduct for 250 miles to bring in Owens Valley water from the north and now proposes to extend this to Mono Basin still further north in order to reach additional supplies. The Metropolitan Water District is actively proceeding with its Colorado River project to bring in 1500 second feet. Despite the fact that it has been necessary to bring in these supplements from outside, local waters still go to waste in times of flood. There is also a constantly increasing discharge of sewage water into the ocean.

MANY ORGANIZATIONS ACTIVE IN WORK

Many organizations are working to the end of saving local wastes. Los Angeles County

Flood Control District is active in the San Gabriel and Los Angeles River watersheds with the dual purpose of salvage of waste and protection from floods. Orange County Flood Control District has laid out a similar program for Orange County. The Tri-Counties Conservation Association is actively engaged in conservation in the upper Santa Ana watershed. Many water companies, both singly and in groups, have made or are making their contribution to this end. But the matter is complex and the object costly to achieve. Many agencies for research and investigation have been busy on the matter for several years past securing data useful and necessary to final consummation of the salvage of local wastes. The U. S. Geological Survey is measuring stream flow from mountains and waste into the ocean. The U. S. Division of Agricultural Engineering is determining wastes of water by uneconomic plant life and contributions to the supply from rainfall on the valley floors. It is also beginning work looking toward increase in efficiency of spreading water on gravel cones. The U. S. Forest Service is organized to protect the watershed and is doing experimental work looking toward increase in efficiency of watershed cover. The City of Los Angeles is investigating the use of sewage water in industry and agriculture. The State Division of Water Resources has done a great deal of investigational work in gathering and analyzing data to determine amounts of waste, possibility of salvage and utilization of the underground reservoirs to better advantage.

PHYSICAL ASPECTS OF THE PROBLEM

The physical situation may be briefly reviewed: The region is supplied by three stream systems, Los Angeles, San Gabriel, and Santa Ana rivers. About 90 per cent of the water supply is secured from underground reservoirs which have captured and held a part of the wild and sudden floods of the region. The area separates into 29 more or

less definitely delimited underground reservoirs, each one of which is tied in with others so that what is done in one toward water supply affects, perhaps, several others. Each one of these is an individual study which must be combined with the whole to reach an answer. Any attempts at salvage resolve themselves finally into attempt at adding to the natural supply of one or more of these underground reservoirs and utilizing them to better advantage. The water plane in practically all of these has been falling for many years past. Into some, even, salt water is penetrating from the ocean. Water is being pumped from below sea level in 162 square miles of the Coastal Plain, according to recent surveys. Salvage of local waste will be available to some and not to others. An important step in investigation will be the determination of shortage in each basin if such exists, source of water available for it, and the effect of development in one basin on the supply to another.

Local wastes occur by floods, by outflow of sewage into the ocean and by evaporation from a high water plane. Only those flood wastes which originate above a reservoir site can be salvaged unless spreading works can be developed which will function in flood times. Salvage of flood waste and of sewage is a matter of public effort, but salvage of water evaporated from seeped lands may not be. It depends on the particular situation. In most cases reclamation of seeped lands will merely result in their cultivation. In other words a useful draft will be substituted for a waste but on the same land. It may not affect the general situation.

WASTES POSSIBLE OF SALVAGE

Only those wastes which it is believed possible to salvage in whole or in part are listed below. Estimates are as follows:

AVERAGE ANNUAL WASTE			
<i>Estimate of Flood Waste Possible to Salvage:</i>			
Los Angeles River	10,000	acre-feet	
San Gabriel River.....	62,000	acre-feet	
Santa Ana River.....	33,000	acre-feet	
	105,000	acre-feet	33%
<i>Measured Sewage Waste:</i>			
Los Angeles and south and west	155,000	acre-feet	
Santa Ana outfall.....	6,000	acre-feet	
	161,000	acre-feet	50%
<i>Estimate of Waste from Seeped Lands:</i>			
Los Angeles River.....	Small		
San Gabriel River.....	10,000	acre-feet	
Santa Ana River.....	45,000	acre-feet	
	55,000	acre-feet	17%
Grand total	321,000	acre-feet	100%

There is also a possibility of salvaging water originating from rain on the valley floor. Present information is not sufficient to determine whether this can be done or to estimate the amount which can be salvaged in this way.

As before stated, plans for salvage of waste flood water are made and actual construction is being actively prosecuted by the Los Angeles County Flood Control District. Plans for salvage have also been made by Orange County Flood Control District. Utilization of other wastes is a matter of study.

EIGHTEEN PHASES OF SALVAGE STUDY

The several lines of investigation which are thought to be necessary are outlined in the following statement. It should not be inferred from the fact that a particular line of investigation is not mentioned that nothing is being done in that line. In fact much work may be in progress. It is merely desired in this memorandum to outline all lines of endeavor which at present appear desirable in order that the matter may be fully presented:

1. Determination of erosion and silting rates, and survey of methods and areas for disposition of such materials.
2. Survey of additional reservoir sites both in mountain and valley.
3. Survey of check dam possibilities and benefits.
4. Investigations to increase efficiency of watershed vegetation.
5. Investigation and survey of spreading works.
6. Investigation of penetration of rainfall on valley floor to water plane.
7. Investigation of noneconomic use of water by plant life.
8. Determination of flood waste into ocean, its quantity and origin.
9. Stream gaging—additional program.
10. Investigation of underground waste into ocean.
11. Investigation of sewage waste into ocean and its utilization.
12. Investigation of intrusion of salt water from ocean and other sources into underground basins.
13. Investigation of shortages in each underground basin of the 29 in the region.
14. Investigation looking toward increased efficiency of operation of underground reservoirs.
15. Investigation of quality of water, both local and imported.

Helpful Highway
"Cops"
Commended

Highway Crews
and Road
Beautifiers

Railroad Has
First Auto Crash

Clippings, Letters and Comment

Dealing with State Highways

Heavy Winter
Travel Into
Mother Lode
Redlands High-
way Beautification
Program
Good Road Build-
ing in California
Now on Business
Basis

East Sierras Highway Work Is Praised.

District Engineer F. G. Somner has received the following letter from Geo. M. Wills, general superintendent of the Southern Sierras Power Company:

In connection with my responsibility with the power company, I am required to make frequent trips over the northern end of our system. I begin to travel on the state highway in the vicinity of Inyokern and continue into Mono Basin in the course of my visit to the different hydro plants. Traveling conditions have so greatly improved in the last few years that I wish to take this opportunity of expressing appreciation of the fine work which is being done by the organization over which you have supervision. The work which is being done appears to be of a very high order from an engineering standpoint and the greatest consideration appears to be given to the traveling public while the construction is going on. It occurred to me at the time of my recent trip to Bishop, that the least I could do would be to send you this word of appreciation.

Helpful Highway "Cops" Commended.

Under the heading "Helpful Highway 'Cops'—They Give Assistance as Well as Tags," the Oakland *Post Enquirer* publishes the following editorial:

It isn't a strange and unusual sight these days along the California highways to see a state highway patrolman helping some poor motorist out of difficulty instead of getting him into difficulty with the traffic court.

If you break the law, the motorcycle cop is just as ready as ever to arrest you—only he is apt to do it a little more politely and graciously than in other days.

But if you break your car, or if you run short of gasoline or oil, he is ready to HELP you.

The other day, along the highway between Oakland and Sacramento, there were many speed cops on their white motorcycles. It was a holiday, and they were out in full force. They didn't seem to be very busy arresting people, but they did seem to be busy helping people—carrying a quart of oil, a can of gasoline to a stranded driver, giving a little friendly assistance and advice to lady drivers changing tires by the roadside.

You may say they aren't PAID for doing these things, and that is true.

Nevertheless, this kind of courtesy from the speed

cops probably DOES pay. It creates a more friendly feeling, gives motorists the idea that the state highway patrol is on the road to help them, not merely to pester them.

When Eugene Biscailuz took charge of the state highway patrol a year or so ago he said he would try to improve the relations between the motoring public and the speed cops—and he seems to have done a good job.

Highway Crews to Aid Road Beautifiers.

District Engineer Gibson is quoted as follows in the Santa Barbara *News*.

"If the people who plant flowers and shrubs along the highway, and their number is increasing," said Gibson while on a visit in Santa Barbara, "will notify the highway commission where these plantings have been made, state crews will not only protect the plantings but they will keep down the weed growth and do all in their power to make the plantings thrive. This is an order from the commission and will be carried out wherever the engineers in charge have information upon which to give instruction to his working crews."

Gibson said that the hollyhocks on Cuesta grade in San Luis Obispo County which have won much praise this year were so protected and weeded by state highway crews this spring. Hollyhocks are particularly recommended by the state commission for roadside planting because they bloom throughout the summer, do not die down and become a fire menace and reseed abundantly and widely.

Director Declares Polo Sport Not Social Event.

This from the dispatches of the United Press:

Bert B. Meek, director of the state department of public works, is a polo addict—in fact it is his hobby. But no one knew anything about it until recently, when Meek was reported as participating in a game between two teams in Sacramento. Asked why he had kept it a secret for so long, the public works director said: "Until you newspapermen recognized that polo was a he-man game and took mention of it off the society page and put it on the sporting page, where it belongs, I just kept my activities under cover. I don't mind seeing my name on the sport page in this connection, but I won't stand for it in the society column."

Narrow Gauge Railroad Has First Auto Crash.

The Sacramento *Bee* publishes the following dispatch from Grass Valley:

Despite the fact that the Nevada County Narrow Gauge Railroad has numerous grade crossings, crossing accidents up to yesterday had been nil since the advent of the automobile. At the Kress Summit crossing yesterday, however, an automobile driven by Mrs. Fred Bierwagen was struck and badly damaged. Mrs. Bierwagen abandoned the machine when it stalled on the rails and a train was heard approaching from around a curve.

The engineer of the train was able to reduce the speed to such an extent that the machine escaped destruction.

* * * * *

Heavy Winter Travel on Mother Lode Highway.

This is from the Stockton *Record*:

Put this one down in your collection of "Believe it or Not."

Week-end travel to the Mother Lode during the winter is nearly 2000 per cent greater than in the summer time.

H. H. Briggs, president of the Central Valley Council of the State Chamber of Commerce, estimates that winter travel is 20 per cent greater; E. E. Ginn, publicity director for winter sports committee, placed it at 200 per cent, and figures of the State Department of Public Works indicate a difference of 2000 per cent.

Here are the figures—judge for yourself: On a Sunday in the summer of 1929 a total of 120 automobiles passed over the Sonora-Mono Pass road, and on a Sunday last winter more than 2000 cars were checked on the same road. That shows a margin of nearly 2000 per cent.

Of course, winter travel in the mountains is usually confined to Sundays, while summer travel is constant throughout the week.

* * * * *

Redlands Highway Beautification Program.

A letter of appreciation from the Redlands Chamber of Commerce to the State Highway Department, carrying thanks of the district for the planting of palms along the Colton avenue highway, today brought reply from C. H. Purcell, State Highway Engineer, highly complimentary to the Redlands chamber, says the Redlands *Facts*. That organization, he maintains, is responsible for the beautification program.

Mr. Purcell writes as follows to Secretary Isham:

"Please accept my thanks for your letter of May 16 expressing appreciation of our efforts in the final planting accomplished by your community on the road entering Redlands.

We are very much interested in the beautification of our roads, and, while we can not initiate the original plantings, we do assume their maintenance after the first year.

I am very sure your efforts will be amply repaid by the appreciation of the motoring public."

The beautification program for this road was launched a year ago by H. Earl Cromas, chairman of the beautification committee of the local chamber. A conference was called in Redlands to which came representatives of civic organizations from Orange, Riverside and San Bernardino counties, and several members of the state highway commission. At that conference pledges of cooperation for planting of highways throughout the southland were made. The Colton avenue plan is among the first to be tackled. Later the Chamber of Commerce hopes to continue the work along the Ocean to Ocean highway between this city and Beaumont.

* * * * *

Good Road Building Now Permanent Investment.

This editorial is from the Los Angeles *Examiner*:

It has cost California millions of dollars to realign and relocate roads which were unwisely built.

It is very satisfying, however, to know that in the last several years the Department of Public Works, which is building our highways now, is locating them so well as to preclude any further expense excepting upkeep and widening as the traffic grows heavier.

Such careful attention means that our road money is a permanent investment, paying dividends to future generations of Californians, as well as to ourselves.

* * * * *

Highway Hoodlums to Be Punished.

The *Indio News* published the following article:

Traffic officers, deputy sheriffs and officials of the State Highway Commission are out to get a gang of hoodlums who have been stealing and destroying lanterns and barriers in the district where oiled shoulders are being placed on the state highway.

Within the past week more than fifty lanterns have been shot full of holes in the district under construction, thus endangering the lives of the traveling public. One lot of about 20 were brought to Indio and dumped on a vacant lot. Many barriers showing where dirt is piled have been deliberately tipped over.

The offenders are facing a stiff jail sentence if apprehended.

NEW YORK—The Lake Champlain bridge between this state and Vermont is proving an indispensable traffic facility judged by the numbers of automobiles and pedestrians which are using it daily.

PENNSYLVANIA—Paved surfaces tested by the "roughometer" in 1929 proved much smoother than those similarly tested in any previous year. Of 532 miles tested 276 reached the standard "excellent," a gain of 111 per cent.

NORTH DAKOTA—Traffic counts conducted on North Dakota highways show that year-around volume is more uniform on farm-market roads at right angles to railroads than on through highways that parallel the railroads.

Progress Report
of Water Study
Investigations

Reports Made to
Joint Hoover-
Young Water
Commission

Review of Recent Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Many
Applications
for Dams Filed

Irrigation and
Water Storage
Districts

WATER RESOURCES INVESTIGATIONS

MOJAVE RIVER INVESTIGATION

The principal field work for the season was concluded by June 1st and the results of the work are now being analyzed in the office. All records of the old Arrowhead Lake Water Company are being reanalyzed and will be made public in the final report. These have previously been inaccessible and are of considerable value.

SANTA ANA INVESTIGATION

A committee representing the Cucamonga and Pomona basins was appointed at a mass meeting of representatives of water users to cooperate with the state in investigation of flood control and conservation of Cucamonga, San Antonio, Deer and Day creeks. This committee is functioning efficiently and three meetings have been held.

On Lytle Creek a similar committee was appointed after a mass meeting of Lytle Creek water users at Rialto and one meeting has been held with this committee. This committee is acting in an advisory capacity to the state on these matters.

Some work is being undertaken on the small creeks from Twin City Creek and Lytle Creek which threaten the city of San Bernardino.

Complete analysis of flows in Santa Ana and Mill Creek is being made and also in Lytle Creek so far as possible, to determine whether reservoirs on these streams are justified.

LOS ANGELES BASIN INVESTIGATION

The report previously made by the division to the Los Angeles County Conservation Association was endorsed by the association in executive meeting. Representatives of the association are now making efforts to get the work financed and are preparing to interest the entire basin in the progress of the work when it is started. The matter of a definite program has been outlined by the association for this purpose.

VENTURA COUNTY INVESTIGATION

This investigation was continued on a routine basis during the month. A committee of water users met with the supervisors in regard to securing an appropriation to continue the work during the season 1930-31 on the same basis as heretofore and such support was pledged by the supervisors. The estimated cost of this investigation was \$15,000 per year to be met by equal appropriations from the state and from the county. In making up the budget of the division sufficient funds were included to carry the work forward during the season 1930-31 because it was apparent at

that time that investigation would have to run at least a year longer than estimated because of unfavorable weather conditions during the time of investigation which has made it impossible to get data which are entirely conclusive.

NAPA INVESTIGATIONS

Regular measurements were taken in Napa River and Conn Creek on May 5, 10, 19 and 25, and a special series of measurements was made on Conn Creek on May 11 for the purpose of determining the location and amount of losses and accretions between the dam site and the gaging station.

SANTA CLARA INVESTIGATIONS

Available data in the office of F. H. Tibbetts, consulting engineer, has been obtained with respect to wells common both to the present investigation and that made by Tibbetts and Kieffer in 1920. All wells of the present investigation have been located upon a map and the elevation of ground surface has been obtained for practically all of them.

On June 2d a meeting was held at Gilroy with representatives of water users in cities in the Morgan Hill-Gilroy area. This area is a northern valley of the Pajaro River system and is a continuation of the Santa Clara Valley. The water plane has been dropping alarmingly of late years and irrigation use of water is increasing very rapidly. The interests of these people also conflict with the interests of the Santa Clara Valley to some extent in the use of the waters of Coyote Creek. The meeting was well attended and a great amount of interest and apprehension over water supply is apparent. They were interested in being informed as to different phases of water law of the state and hope to get an appropriation for investigation of the water situation. They were advised that funds are not now available for such an investigation and that the usual practice was for the state to contribute half of the money needed for investigation if local interests would match state funds. They are now proceeding to organization and expect to request that the investigation be taken up at the next legislature.

They were informed by Senator Jones that his conception of the state-wide plan was that areas such as this could expect help in bringing in outside water supply only after they themselves had developed local sources.

PIT RIVER INVESTIGATION

Routine field work was continued throughout the month on this investigation.

SAN JOAQUIN VALLEY INVESTIGATION

Ground Water Investigation: Maps delineating the ground water level in Kern County area for the years 1920 and 1924 to 1929, inclusive, have been completed.

Similar maps for the three years of record covering the area from Kern County north to Madera County are about 50 per cent completed. Additional well observation records have been transcribed, bringing the total number of records up to 4900. A tabulation of intraseasonal fluctuations, high to low, have been completed for the period of record; four units in Kern County and in the Alta, Consolidated and Fresno Irrigation districts. A map has been prepared showing the concentration of pumping plants in the Fresno district.

Land Classification: Classification of minor foothill areas on the Merced, Tuolumne, Stanislaus, Calaveras and Mokelumne River has been completed.

Water Supply Studies: Five studies were made on the San Joaquin River to determine the irrigation yield from that stream utilizing only the waters that are now attached to the grass lands for capacities of diversion canal varying from 1500 to 3000 second-feet.

Main Supply Canals: A meeting of the Engineering Advisory Committee on the San Joaquin Valley investigations was held on June 12th followed by a field trip on the 13th and 14th. The purpose of the meeting was to review different proposed schemes of exporting water from the Sacramento and the San Joaquin Delta to Mendota on the San Joaquin River.

SACRAMENTO VALLEY INVESTIGATION

Water Supply: Tabulations setting forth the full natural run-off and the run-off as would be ultimately impaired by upstream use have been prepared for all the major streams in the Sacramento Basin. Preliminary estimates of the irrigation yields of the Kennett Reservoir on the Sacramento River, Oroville Reservoir on the Feather River, Upper and Lower Narrows Reservoir on the Yuba River, Camp Far West Reservoir on the Bear River, Monticello Reservoir on Putah Creek and Millsite Reservoir on Stony Creek have been made for an estimated maximum deficiency of a perfect seasonal supply.

Water Requirements: Data are being collected and compiled in conjunction with the land classification for the purpose of estimating ultimate water requirements in the Sacramento River Basin. These estimates correlated with the irrigation yields from the reservoirs on the various streams will determine the water surplus, if any, to the ultimate needs of the Sacramento River Basin.

Exploration Work at Kennett Dam Site: Topographic surveys of the Upper Narrows and Coloma dam sites have been completed during the past month. Exploration work at the Kennett dam site is progressing rapidly under the direction of the U. S. Army engineers.

SALINITY INVESTIGATION

Office work on salinity investigations during the past month has been continued on the preparation of final maps, diagrams, tables and compilations for the report. The analytical studies on the relations of salinity to tidal action and stream flow are practically completed, and the report of the results of these analytical studies is under preparation.

Field work on salinity investigations has been confined to the maintenance of the regular salinity observation stations and the automatic tide gage stations.

SALT WATER BARRIER INVESTIGATIONS

Work was continued during the past month on the field surveys of industries, public water supplies, industrial water front structures and agricultural development. The industrial survey, together with that of the public water supplies and industrial water front

structures is largely completed. Surveys have been made of 120 industries in the area extending from Brentwood and Isleton on the east to Richmond on the south and west. Of these, questionnaires have been completed on 65 and the remaining number have been completed except for final executive approval from head offices of the various companies. Sixteen public water supply systems have been surveyed and complete data obtained on 14. Surveys have been made on 221 industrial water front structures and data completed on about 75 per cent of this number. Work on the survey of the agricultural development, especially the reclamation features in the delta of the Sacramento and San Joaquin rivers has continued during the month in cooperation with Mr. George A. Atherton and other representatives of the delta reclamation districts.

The special studies on the geology of the various proposed sites of the salt water barrier have been continued in consultation with our Consulting Geologist, Prof. C. F. Tolman of Stanford University. In addition, another special study has been started during the month on evaporation and transpiration in the bay and delta area; this work is being done under the direction of Mr. Charles H. Lee, Consulting Engineer of San Francisco.

The cooperative work on the investigation by other state departments and the federal government has continued during the past month, including the intensive investigation of the U. S. Army Engineers on the problems of navigation and flood control, tidal and silt studies, and the studies of sewage and industrial waste pollution by the State Department of Public Health, and studies of the possible utilization of the barrier as a highway crossing by the Division of Highways.

MISCELLANEOUS INVESTIGATIONS AND ACTIVITIES

A report on water supply for a women's prison in Britte Valley has been completed and submitted to the Director of Finance and to the committee in charge of the work of selecting a prison site.

Considerable time has been spent in the preparation of a bibliography, history and resume of all cooperative investigations (engineering) in which the state has been interested since 1900. In addition, an outline of present cooperative projects is being made to show statutory authorization, appropriations, contracts or agreements, description of projects, supervision and reports, and budgets and accounting. This work is still in progress.

The collection and compilation of data for a report on Sacramento River riparian lands and use of water on them both for normal and flood flow conditions has been completed.

HOOVER-YOUNG COMMISSION

The seventh meeting of the Joint Legislative Water Committee and the Hoover-Young Commission convened at Hotel Oakland, Oakland, on June 10, 1930, with an excellent attendance by members of both the legislative committee and the commission. There were present in addition numerous interested individuals from the public.

Assemblyman Wm. P. Jost, chairman of the Legislative Fish and Game Committee, requested the support of the committee and commission for increased state and federal appropriations for migratory game refuges. He also presented and filed proposal and recommendation of the Wild Life Development League for Manley S. Harris, president.

Mr. Jas. P. Burke of Visalia submitted data showing increase of areas affected by receding ground water

levels in the San Joaquin Valley, and described the water situation as it affected the four northern San Joaquin Valley counties. Copies of his brief with maps submitted by the San Joaquin Counties Water Committee were filed with the commission and legislative committee.

Mr. H. F. Ormsby, secretary of the California Development Association, submitted a proposal that a representative be recommended to attend for California at the Salt Lake Conference of 11 western states to be held June 26-30, 1930. After a consideration of the request, it was decided that the commission should not be represented, but a motion was adopted instructing the secretary to communicate with the State Chamber of Commerce regarding the desirability of the chamber sending a delegate or delegation to the Salt Lake City conference.

A communication from Mr. Fred G. Stevenot, Director of Natural Resources, requested an appearance before the committee and commission at some future hearing, the date to be set at the convenience of the committee and commission.

Mr. V. S. Barber appeared for the Mining Association, stating that possibly they may later request a hearing on the "Relation of the state-wide plan to hydraulic mining."

SNOW SURVEYS

Work in this connection during the past month has been confined chiefly to office computations. All 1930 snow survey notes and computations were checked and results tabulated in proper form for later analysis. Tabulation of all available snow survey data for previous years has been completed. Curves and diagrams are in course of preparation for use in studying the relation between snow, precipitation, temperature, and run-off for each basin. In the field, certain courses in the Feather Basin have been relocated as shown to be necessary by the 1930 surveys. Supplies and equipment have been brought in for storage from certain of the shelter cabins now accessible by auto. Surveys were made in the latter part of May at the Mount Shasta course (elevation 8000) and at Kaiser Pass course (elevation 9200) in the San Joaquin Basin. These showed a melting of the April 1st pack of 27 per cent for the Shasta course and 69 per cent for the Kaiser Pass course.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The regular field work is in progress with three engineers handling all measurements of stream flow and return flow and recording all diversions in the Sacramento-San Joaquin area. A fourth man is dividing his time between field and office work in bringing all necessary mapping, tabulations, files, etc., up to date. In studies of the San Joaquin Valley return water it appeared that more data were needed on the return in the early and late parts of the irrigation season. For this reason the San Joaquin return water measurements were started earlier this year and all gages were installed and in operation before June 1st.

On the investigation of the delta consumptive use of water (cooperative with Division of Agricultural Engineering, U. S. Department of Agriculture) one engineer is resident at King Island and gives full time to the work. Supervision is given by Major

Stout from the Berkeley office of the U. S. Department of Agriculture, who is also preparing a detailed and final office report on the delta consumptive use of water. This report is due in August and it is expected that the present season will see the completion of the delta investigation.

The field work of the salinity investigation has been continued with the maintenance of regular salinity observations at twenty-seven stations and sampling of drainage water at seven stations. Maintenance of the nine new stations established late in February in the north San Pablo Bay area has been continued. The encroachment of the salinity as the summer advances will be carefully observed by the establishment of all stations required to properly record the upstream movement. Six tide gages are being maintained by the Water Supervisor's force and fifteen by cooperating agencies.

On June 10th the discharge of the Sacramento River at Sacramento was 10,900 second-feet and the San Joaquin River near Vernalis was flowing 3600 second-feet, making a combined flow of 14,500 second-feet. The corresponding Sacramento, San Joaquin and combined discharges on June 10, 1929, were 7360, 3670, and 11,030 second-feet, respectively.

Bulletin No. 23, Report of the Water Supervisor for the five years, 1924 to 1928, should be received from the printer and be available for distribution early in August.

IRRIGATION, WATER STORAGE DISTRICTS

During the present month visits of inspection have been made to the following districts in connection with their construction progress, water supply, financing and economic problems:

Ladera Irrigation District	Riverside County
Fallbrook Irrigation District	San Diego County
Vista Irrigation District	San Diego County
La Mesa, Lemon Grove and Spring Valley Irrigation District	San Diego County
Palmdale Irrigation District	Los Angeles County
Little Rock Irrigation District	Los Angeles County
La Canada Irrigation District	Los Angeles County
Merced Irrigation District	Merced County
Hollister Irrigation District	San Benito County
So. San Joaquin Irrigation District	San Joaquin County
Linden Irrigation District	San Joaquin County
Richvale Irrigation District	Butte County

Under date of June 17, the State Engineer reported unfavorably to the Board of Supervisors of Butte County in the matter of the formation of the proposed Rio Seco Irrigation District, comprising approximately 8000 acres of land located in Butte County.

The State Engineer has reported favorably to the California Bond Certification Commission upon request of the El Camino Irrigation District for validation of \$7,000 par value of their bonds and authority for the sale of these bonds, and approval of an expenditure of \$7,000 for the purchase and installation of well equipment required in the development of the project.

The request of the Linden Irrigation District for authority to proceed with a bond election in the amount of \$140,000, the funds from the sale of which are to be expended in the development of an irrigation supply, is now under consideration of the State Engineer.

DAMS

Applications Received for Approval of Plans and Specifications for Construction or Enlargement:

Dam	County	Owner	Estimated cost
*Bear Gulch	San Mateo	Bear Gulch Water Company	\$73,000 00
**Renbow	Humboldt	Renbow Power Company	45,600 00
**Webber	Creek El Dorado	El Dorado Irrigation Dist.	300,000 00

An increased activity in dam construction is evidenced by this list of applications. The largest new project coming before the office during this period is that of the El Dorado Irrigation District, which proposes to build an earthfill dam on Webber Creek to replace their former structure. The new dam will be nearly 150 feet in height and have a storage capacity of 6000 acre-feet. This will materially increase their present storage and provide for the growing demands of this locality.

Plans were received and approved for repair and alteration of the following dams:

Dam	County	Owner
Hillside	Inyo	Hillside Water Company
Fuller Lake	Nevada	Pacific Gas and Electric Company

Orders authorizing use have been issued pending completion and issuance of approval for the following dams:

Dam	County	Owner
Salt Springs	Amador & Calaveras	Pacific Gas and Electric Company
Lyons	Tuolumne	Pacific Gas and Electric Company

Mulholland Report:

On November 15, 1929, the city of Los Angeles filed application for approval of the Mulholland Dam. Because of the widespread discussion of the safety of this structure, its location with respect to Hollywood and the many technical features involved, the State Engineer appointed a consulting board to advise on the technical considerations of the structure.

The final report of the board was received on April 18, 1930. On April 22, the city filed a new application, in lieu of the one made in November, for approval of certain proposed changes in Mulholland Dam: namely, to construct a spillway 35 feet lower than the present spillway, to construct an extensive earth and rock fill adjoining the downstream face of the dam, and to provide openings in the dam to limit the quantity of water that can be stored. These proposed changes, not requiring additional geologic information, the State Engineer requested the engineer members of the board to review and report upon the engineering features of the plan accompanying the new application.

Based upon the findings of the Consulting Board, supplemented by the report of the engineer members of the board, the State Engineer on May 6, 1930, approved the application filed by the city for modification and betterment of the existing structure.

The findings of the board may be best stated by quoting from the conclusions of the two reports. Concerning the existing structure the board concludes as follows: "In accordance with its purpose, the board has based its opinion entirely on engineering and geologic data and considerations. A favorable location in Weid Canyon was selected for this dam, and the precautions taken in construction were sufficient to meet the actual engineering needs. Although the foundation rock is affected by small fault slips, its physical condition is otherwise good, and there is no reason to expect that it will deteriorate appreciably due to the

conditions imposed by water storage. In the opinion of the board, therefore, the Mulholland dam is safe."

Concerning the proposed alterations the engineer members of the board state, "The proposed embankment of mixed rock and earth, efficiently drained, placed against the downstream face of the Hollywood Dam to elevation 715 feet will increase the safety of the dam."

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Flood control project maintenance work during this period has been mostly routine and consisted of repairs to structures, cutting weeds, making fire breaks and irrigating willows. No construction is under way.

Two dragline excavators have been engaged in cleaning the canals of the drainage system. One dragline excavator completed its work on June 11 and the work of the other machine will be completed in a few days.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

The work of bank protection on the right bank of the Sacramento River near Princeton in cooperation with Reclamation District No. 2047, consisting of two tree current retards, has been completed at a cost of \$6,000.

Bids were opened on June 5 for the construction of a sand fill and river levee pavement at Isleton, in cooperation with the Division of Highways. The low bid was submitted by O. G. Richtie of San Jose and the contract has been awarded to him at a price of \$7,208.65.

Arrangements have been made for the repair and enlargement of six tree current retards on the right bank of the Sacramento River at Hamilton Bend, near Colusa, in cooperation with Reclamation District No. 2047, at a cost of \$7,000.

Arrangements are being made for additional bank protection work on the San Joaquin River at Tom Paine Slough in cooperation with the California Irrigated farms, to cost \$600.

SACRAMENTO FLOOD CONTROL PROJECT

Timber clearing work in the Sutter By-pass has continued with a force of approximately seventy men, and two camps are in operation. All of the money available for this work out of the Joint Navigation and Flood Control Project Fund for this fiscal year will be expended by July 1. Surveys of the area cleared are being made and mapped.

Of the five contracts for clearing timber in the Feather River overflow near Marysville one is completed and the others are well toward completion, except in some portions of the area where it is at present overflowed with water.

A number of reports on applications have been prepared for the Reclamation Board, and one meeting of the board was attended by the Deputy in Charge of Flood Control and Reclamation. The Deputy in Charge of Flood Control and Reclamation also attended two meetings of the Construction Committee of the Flood Control Association.

RUSSIAN RIVER JETTY

The construction of the timber and pile portion of the jetty has continued throughout the period with a

*Enlargement.
**Construction

force of eleven men, and an additional force of five men operating the quarry and railroad depositing rock along the structure. The timber portion of the jetty has now been extended approximately 240 feet this spring, and it is planned to extend it 60 feet further. The channel through the bar is now open along the north side of the jetty.

NAVARRO RIVER JETTY

Bids were opened on June 5 for the construction of a rock jetty at the mouth of the Navarro River in Mendocino County and the low bid was submitted by Christie and Allen of San Francisco and Fort Bragg. The contract has been awarded to this firm at a price of \$4,575. Construction work will be commenced in a few days.

WATER RIGHTS

During the month of May there were 25 applications to appropriate water received, 13 canceled, and 22 approved. Fourteen permits were revoked and three licenses issued.

ADJUDICATIONS

Shasta River (Siskiyou County): The Long Bell Lumber Company's exception relative to water rights on Beaghan and Boles creeks was heard in the superior court of Siskiyou County on June 13, 1930. This was the final hearing on the exceptions filed in the Shasta River adjudication proceedings. The entire proceedings are now before the superior court awaiting the court's decree.

Whiteriver River (San Bernardino and Riverside Counties): Still pending in the superior court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County): Submission of referee's final report still being withheld pending negotiations now in progress towards settlement of one of the important issues.

Oak Run Creek (Shasta County): Case still pending in superior court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County): Case still pending in the superior court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County): Case still pending in the superior court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County): Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County): A stipulation for consent judgment is being circulated among the parties who were not present at the water users' meeting held at Davis Creek on March 18th.

Mill Creek (Modoc County): The trial schedule of distribution proposed by the Division of Water Resources was administered by a water master throughout the month.

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month. The plane table survey of the irrigated lands which was commenced on May 6th, was completed on May 24th.

Franklin Creek (Modoc County): The case of *C. E. Crowder vs. P. Indart et al.* involving the deter-

mination of the water rights of Franklin Creek, Modoc County, was referred to the division by the superior court of Modoc County by order of reference dated June 10, 1930.

WATER DISTRIBUTION

Davis, Emerson, Mill, Owl and Soldier Creeks (Modoc County): Water master service on these streams was continued throughout the month.

Little Shasta River (Siskiyou County): Water master service on this stream was continued throughout the month.

Pit River (Modoc and Lassen Counties): Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River investigation. The Big Valley Water Users Committee met with the resident engineer on May 31st. General river conditions were discussed and plans outlined for the following month's distribution.

Hat and Burney Creeks (Shasta County): Water master service on these streams was continued throughout the month.

North Cow, Oak Run and Clover Creeks (Shasta County): Water master service was commenced on these streams for the 1930 season on June 1st and involves the distribution of water to approximately 2900 acres of land.

IMPORTANT PROGRESS ON EAST BAY HIGHWAY

(Continued from page 14.)

afforded quick access to San Francisco via the San Francisco Bay bridge and the Bayshore Highway. Southbound traffic enjoys equally good connections with the Dumbarton Bridge leading to Palo Alto and adjacent peninsula territory.

Construction costs of this section between Hayward and Niles were approximately \$352,000, exclusive of engineering. The Hanrahan Company of San Francisco were the contractors. W. A. Rice was the resident engineer.

The trouble with
Our traffic rules
Is they're no good
At stopping fools.
—The Cincinnati Enquirer.

"Really, I can't play golf," the sweet young thing said. "I don't even know how to hold the caddy."
—Drexler.

"There's something wrong. This gear shift doesn't work."

"That isn't the gear shift, Jack. It's—er—it's my knee."

A colored agent was summoned before the insurance commissioner.

"Do you know," said the commissioner, "that you can't sell life insurance without a state license?"

"Boss," said the darkey, "you suah said a non'-ful, I doue learned I couldn't sell it, but I didn't know the reason."

PROTECTION AGAINST FORCES OF NATURE IN CALIFORNIA HIGHWAY CONSTRUCTION

(Continued from page 7.)

trestles are constructed along the highway for the passage of streams.

DYKES

In open valley locations where the cones are not so well defined or act only as feeders, it has been necessary to construct extensive dyke systems and to conduct the water under the highway by means of large culverts or trestle structures.

SEA PROTECTION

The sea has been a constant menace to construction in many localities but it is quite usual that highways may be located where this danger is averted. However, in a number of places considerable sections of highway have been located along the sea and it has been necessary to provide structures for its protection.

RIPRAP

Random riprap with the majority of stones weighing not less than five tons has been used to some extent on highway work, but the type of equipment makes the handling of heavy stones extremely difficult. This situation arose in connection with certain work in southern California along the rocky coast north of Santa Monica.

CONCRETE CELLS

It was decided that since large rock could not be handled at the site of the work that concrete boxes or cells should be constructed which could be lowered into place and afterwards filled with concrete to increase their weight. The shore line at this location consisted of rocky bluffs with a steep slope into deep water. It was possible to place the concrete cells along the low tide line but owing to the heavy run of the sea, it would have been impossible to have built slope walls without some protection. Accordingly, such leveling and draining as was possible was done at low tide and the concrete cells were then sunk into place on the prepared foundation and were filled with concrete and heavy stone between tides. Behind the protection of the concrete cells it was then possible to excavate for the construction of a toe wall on which the reinforced concrete slope wall could be placed. This slope wall was made 9 inches in thickness, heavily reinforced and was capped by a wave deflecting section intended to throw

the waves back on themselves. Previous to placing the slope paving, a bedding of stone was roughly laid on the earth slopes. The work could only be done during periods of calm weather and on this account was handled by day labor. It has now survived a number of heavy storms and the protective work may be said to be a success.

SHEET PILING

The use of sheet piling on state work has never met with much success and it has not been used extensively in sea protection.

GROYNES

Groynes have been extensively used along the south coast and the beach has been restored in many locations by their use. The state construction usually contemplates the use of wooden structures but some of the private beach owners have used steel sheet piling with considerable success. These structures are usually placed at slightly less than right angles to the drift of the current, carry sand and are placed at approximate high tide elevation. The most successful are built of two lines of sheeting properly braced and filled with rock.

SEA WALLS

In one or two locations, the state has constructed heavy sea walls of monolithic concrete of sufficient strength to withstand the action of the heaviest waves. These have been built with the usual throw back design of top which has proved effective wherever tried.

SAND DUNES

In a number of locations in this state we have been faced with the problem of control or elimination of sand dunes which have constituted not only a serious burden on our maintenance but have been extremely dangerous to traffic. It is quite usual for a sand storm to, within a few hours, place a dune across the highway several feet in depth which would require constant labor to remove. On one particular dune the state had an annual expense of about \$7,000 for keeping the road clear over a section of a few hundred feet. A study of the habits of dunes and their movements made over a number of years demonstrated that they could be conquered if proper means were used. It was found that in many given localities the majority of the dunes moved in a certain direction and attained a height which was seldom exceeded. By the construction of a high grade line over the worst section of dune, the engineer entirely eliminated all dangerous drifting and we now have a road which is clear at all times.

In another location a study of the dune indicated that it could be removed by wind action by cutting channels at suitable locations. This work was done and the dune was removed at a cost of a few hundred dollars and the removal of similar dunes has since been accomplished by the same method at a very low expense to the state.

EARTHQUAKES

As you are, no doubt, aware, certain parts of California are visited by earthquakes from time to time and these offer an unusual problem to the highway engineer. Some of us are of the belief that a number of our concrete highways have been shattered by these disturbances and we believe that the construction of proper expansion joints will eliminate this danger. We have also found it necessary to construct our fills in earthquake country to the greatest solidity and also to clean up slopes so that there are no hanging rocks in any location. On one of our jobs we suffered a loss due to combined earthquake and cloudburst of over \$30,000 in one storm which brought down enormous boulders on a section of highway some eight miles in length. During the Santa Barbara earthquake, we found that our highway had been shaken from side to side until there was a gap some four inches wide along each side of the highway in the vicinity of Santa Barbara. The highway had also buckled at a number of locations and had settled at bridge abutments. Generally speaking, however, the danger due to earthquakes is not serious so far as highways are concerned.

The foregoing outline of the problems which have been overcome by the engineers of the Division of Highways indicate only a few of the very interesting and important problems which they are given to solve in the routine course of highway construction.

A fraternity had sent its curtains to be laundered. It was the second day that the house had stood unveiled. One morning the following note arrived from a sorority across the street:

"Dear Sirs: May we suggest that you procure curtains for windows? We do not care for a course in anatomy."

The chap who left his shaving to read the note answered:

"Dear Girls: The course is optional."

"Has anyone ever been lost in crossing here?" asked a timid woman who had hired a boatman to ferry her across the river.

"No'm," was the reply, "Mah brother was drown'd heah las' week but they foun' him the nex' day."

Overheard as a somewhat flustered young thing descended from the sedan: "Say, Mayme, I see you been on the rumple seat."—*Boston Herald*.

A LEGAL RIDDLE

Udoxes contracted to instruct Harmonius in rhetoric. The arrangement was that Harmonius should pay a fee in two installments. The first was to be paid at once. The second was conditional on Harmonius succeeding in his first case; should he lose, then he could consider his instruction poor and the second installment canceled. He paid the first installment and was duly instructed, but failed altogether to practice. Becoming impatient at the delay, after two years had passed Udoxes sued him for the balance of the fee. He argued thus: "If I win this suit, then Harmonius must—by judgment—pay me. If I lose it, then he will have won his first suit and will still have to pay me." It seemed that he was in an unsailable position. Harmonius, however, argued otherwise. "If Udoxes wins the suit against me, then I shall have lost my first suit and need not pay him. If, on the other hand, I win the case, then by judgment of the court I need not pay him."

History does not relate the result of the suit.—*London Times*.

VACATION TIME

Warm days comin' back again,
Song birds singin' in de lane,
Sly ole turtle on de rock
Got his little eyes half cock
At ole 'gator crawlin out
On de bank to move about.
Warm day sun's a-shinin' hot—
Orter work, but 'druther not—
'Druther lay right down an' sleep
In de clover sweet an' deep.
Sky looks sich a pretty blue,
Cow gives sich a lazy moo.
Bees go buzzin' lazy by.
I kain't work, suh, ef I try.
Got to hit de woodland track—
Wid warm days a-comin' back.

—*Florida Times-Union*.

MICHIGAN—This state will be one of the first to establish an organized system of marking county highways in such manner that they will "key in" with the state system of numbering.

MASSACHUSETTS—A by-pass in Andover and North Andover to route traffic away from the main street is being contributed by a number of public-spirited citizens who are making a gift of the land required and are bearing the cost of engineering work involved.

QUEBEC—The coming winter will see many of Quebec's highways open to year-round traffic for the first time as the economic necessity of all-year motor communication is being realized.

"Gosh," exclaimed the young doctor, looking at that car he was thinking, thinking, thinking, of buying, "the mere sight of it sets up violent cardiac disturbances, superinduces dryness of the palate, epiglottis and larynx, brings on symptoms of vertigo and raises the diastolic blood pressure 20 centimeters."

Officer Seizes Severed Jugular; Saves Auto Victim

An almost superhuman bit of first-aid work by State Traffic Officer Chris Reed may have saved the life of Mrs. Helen Emrie, wife of the trainer for the Agua Caliente stables, whose jugular vein was severed in an automobile crash three miles south of Chula Vista, says a recent issue of the *San Diego Union*.

In the same crash two veteran jockeys, Eddie Taplin and Walter Martin, were less seriously injured.

Mrs. Emrie was thrown through the windshield in a collision between two cars, and her throat was cut literally from ear to ear. The jugular vein was severed, and there were lacerations of the forehead and temple.

STOPS BLOOD

Reed, who was first to arrive on the scene, gathered the spouting jugular between his fingers and pressed until he had stopped the blood. He held the severed vein while Mrs. Emrie was lifted into an ambulance and he held on during the six-mile race to the Paradise Valley sanitarium.

There, it was said, she has an even chance for recovery. Dr. A. D. Butterfield, after more than an hour's work in patching the severed vein, said that Mrs. Emrie would almost certainly have died had Reed not resorted to heroic emergency treatment.

Later news reported that Mrs. Emrie was fully recovering.

Heed Warning Sign "Men at Work"

J. N. Byers, while working on the state highway south of Madera, was struck by an automobile and suffered injuries from which he died the same evening. This unfortunate accident occurred on Saturday, July 12th. Another maintenance employee, M. Reta, was also severely injured, but will recover.

Both of these men were employed in spreading gravel on newly oiled patches on the pavement. "Men at Work" signs were displayed and the state truck carrying the screenings was standing in front of the men. Despite these precautions, the car crashed into the men, caromed from the rear of the truck, carried Mr. Byers 75 feet across the road and then collided with a tree.

Purcell is Named on International Highway Committee

State Highway Engineer C. H. Purcell has been appointed a member of a new committee organized by the American Association of State Highway Officials and to be known as the Committee on International Highway Relations. The chief purpose of this committee is to cooperate with the adjoining nations on all roads being constructed, meeting at the borders. These roads will be known as national highways without designation and no particular road will be given a title, as for instance—Pan American Highway, or Canadian-United States Highway. In this connection, several points of entry have already been designated by agreement with the Mexican officials and the officers of the association. It is hoped that definite agreements may also be secured with the provinces of Canada.

COMPLETE NUMBERING OF U. S. HIGHWAY ROUTES IN 1930

Reports received by the Bureau of Public Roads, U. S. Department of Agriculture, indicate that the work of erecting the standard markers for numbered routes in the United States System of Highways will be practically complete at the end of the construction period of 1930. The system was adopted less than five years ago by state highway departments, and comprises approximately 97,000 miles of the most important highways of the nation. Practically all of these routes are also in the federal-aid highway system.

All east and west highways, as well as their branches, have even numbers; all those running north and south with their branch lines have odd numbers.

Cop: Lady, don't you know this is a safety zone?
Woman Driver (in difficulties): Of course—that's why I drove in here.—*Missouri Pacific Magazine*.

A forest of 10,000 young trees was recently planted near Bolton, New York, in honor of the late Stephen T. Mather, former director of the National Parks Service. The trees, white pines, were furnished by the New York Conservation Department.

The driver, a girl 16 years of age, collapsed from the shock, necessitating her removal to a hospital. The motoring public can show no greater appreciation of the efforts of the maintenance crews to maintain the state roads in first-class condition than by careful driving and avoidance of injury to the men who daily risk their lives to contribute to the comfort of the motorist.

SYNOPSIS OF REPORT ON ADDITIONS TO STATE HIGHWAY SYSTEM

(Continued from page 4.)

cent of the total travel. The road is 15.5 miles in length and lies in Los Angeles and Orange counties.

HIGHWAYS AFFORDING RELIEF TO HEAVY TRAFFIC ON PRESENT STATE ROADS

1. *A highway from Lancaster to a connection with the San Bernardino-Nevada state line highway (Route 31) near Cajon.* This route will make possible a short cut from San Bernardino to the San Joaquin Valley or to the East Sierra highways that extend through Owens Valley and up into Tahoe and Nevada. This cut-off offers advantages in avoidance of congested areas which will develop a volume of traffic more than that necessary to justify construction and maintenance costs. The road is 49 miles long and is situated in Los Angeles and San Bernardino counties.

2. *Castaic Junction to a connection with the Coast Highway near Ventura.* This road qualifies for inclusion in the state system both by reason of the relief it affords alternative state highways and the volume of state traffic now using it. It is at present a well traveled county highway following the Santa Clara River drainage. Its length is 39.5 miles and it lies in Los Angeles and Ventura counties.

3. *A highway from the southern terminus of the San Bernardino County to Bear Lake highway (Route 43) to Newport Beach via the Santa Ana Canyon.* This route forms a logical unit of the state system without likelihood of being supplanted by parallel service of equal value. It also qualifies because of the large volume of state travel that it now carries. It connects state highways serving San Bernardino, Redlands and Riverside and the coast. By this route, traffic avoids the inconvenience and congestion of the longer and busier highways. Its length is 63 miles. It lies in San Bernardino, Riverside and Orange counties.

4. *An extension of the Arroyo Seco state highway (Route 61) from Red Box to a connection with the Azusa to Pine Flats highway (Route 62) near Big Pine Flat.* This road qualifies because of the relief that it will afford for congested state highways of a recreational character and as a necessary addition to make fully available the expenditures on the important Arroyo Seco recreational highway. It lies in Los Angeles County and is 37 miles in length.

5. *Mojave to Bakersfield via Tehachapi Pass.* This road forms an important through route between the San Joaquin Valley and a wide area south and east of the Tehachapi Mountains. It connects the Valley Route (Route 4) with the state highway running north and south between the San Fernando Valley and Owens Valley (Route 23). At Mojave it connects with the state highway which leads east to interstate connections via the Arrowhead Trail and the National Old Trail routes, and is the most direct route to central and northern California for eastern travel over these latter routes. It forms a passage over the Tehachapi range, supplementing and relieving the Ridge Route. It is 60 miles in length and lies in Kern County.

6. *A highway from Santa Barbara to a connection with the Coast Highway near Zaca via San Marcos Pass.* This is an alternative to the Coast Highway north of Santa Barbara, shortening the distance by 10 miles. It is recommended for inclusion in the state system as a first unit of a parallel route to the present coast road to be eventually extended. Its attractive scenic features and shorter distance will attract a large amount of traffic. It is 38 miles in length and lies in Santa Barbara County.

GOVERNOR YOUNG'S STATEMENT

Commenting upon the report, Governor Young had the following to say:

"I feel that this report formulates a policy and establishes a precedent that will govern future additions to the state highway system upon their ability to qualify as of state importance. Previously expert study has followed the addition of roads to the state system. Now we are studying the roads before they are made state highways.

"This is the third major construction that the present administration and the legislature have made to the state highway system. The other two are first, financing new highway construction by the one-cent gasoline tax, and second, the application of the budget to state highway expenditures. The budget gives notice to the public in advance of the expenditure of highway funds, just where and how it is proposed to make expenditures. It is this program coupled with funds from the gasoline tax that has made it possible for the state highway authorities to increase highway work in the splendid manner that they have during a period of unemployment.

"The establishment of a policy assuring orderly and proper extensions to the state highway system solves the last of the major problems connected with our state roads. It means that California can continue the wonderful stride at which its state highway system is now being completed, that the expansion of the system will be along proper lines and that this state should continue to enjoy the reputation for fine highways that has contributed so much both to its growth and the enjoyment of its people."

MASSACHUSETTS—To insure uniformity in the design, location and operation of traffic signals, the Department of Public Works has recently taken over complete statewide control of these signals.

NATIONAL—Announcement, early in May that the Red Cross will establish and maintain first-aid stations along the highways, is a step forward in mitigating the disastrous results of our huge annual automobile accident toll.

NEBRASKA—Interstate traffic on Nebraska's through highways has increased more than 63 per cent since 1926 when the daily average noted at eleven stations was 226.5 vehicles.

NEW YORK—Methods first employed by John A. Roebling in 1854 are being used today in spinning the aerial cables of the 3000-foot suspension bridge being constructed across the Hudson River at Poughkeepsie.

PENNSYLVANIA—Exterior decoration on the new state highway building at Harrisburg recognizes the roles played by men and machinery in modern road building. The archives show road machinery—tractors and rollers—and a survey party.

WYOMING—At the end of the present construction season Wyoming highways will have 311 miles of oiled surface. Two million gallons of oil, to be purchased from local refineries, will be used this year.

First Mr. Blank—How do you find the roads on your recent automobile trip?

Second Mr. Blank—Well, the roads they named after that President, Mr. Lincoln, they were fine, but the roads they named after the Frenchman, Mr. Detour, they were terrible.

THE GOLDEN STATE HIGHWAY

(Continued from page 12.)

At the point where the Golden State Highway crosses the San Joaquin River north of Herndon an improvement was completed last year which eliminated two main line crossings of the Southern Pacific Railroad and considerable poor alignment. This was accomplished by rerouting west of the Southern Pacific, between Herndon and Tharsa, and constructing a new modern bridge over the San Joaquin River. The cost of this improvement was slightly less than \$300,000. Besides eliminating the dangerous grade crossings, the alignment was greatly improved and the distance shortened approximately 900 feet in a total distance of less than 2 miles.

South of Fresno an improvement is planned including resurfacing and widening pavement to a width of 30 feet from Pancher Creek to Fowler, and resurfacing and widening to 30 feet from Fowler to Fowler Switch canal, a total length of 7½ miles. Bids for this work were opened on May 25th.

WORK IN TULARE AND KERN COUNTIES

In Tulare County from Kingsburg to Goshen, the existing pavement is the old 15-foot by 4-inch concrete base. It is expected that the Golden State Highway through this locality will be improved to 20-foot pavement in the next biennium. With the exception of 8 miles from Tulare to Tipton, the remainder of the Golden State Highway in Tulare County is now improved to a high standard 20-foot pavement. The old sharp curvature around railroad reservations and entering and leaving cities, has been eliminated on these new improvements by use of large radius curves. Improvements in this locality during 1929 and 1930 have required an expenditure of approximately \$540,000.

In Kern County the Golden State Highway is now improved to a 20-foot pavement with the exception of approximately 5 miles north of Bakersfield. South of Bakersfield, approaching the Tehachapi Mountains, is a 17-mile length of highway which is entirely without curvature. The contiguous land is barren and dry, but the highway is bordered on both sides by a row of trees which were planted many years ago and have been given constant attention to promote their growth. At the end of the 17-mile tangent at a point known as the Grapevine Station, the road begins the ascent of the Grapevine Grade, reaching a summit about 3 miles south of Lebec in Los Angeles County.

IMPROVING THE GRAPEVINE GRADE

Plans for improvement of the Grapevine Grade contemplate a standard of alignment and grade which will be equivalent to that being used for relocation of the old Ridge route. Much of the existing curvature will be eliminated by relocation and the 10-mile distance reduced about 1 mile.

Plans for improvement contemplate the widening of all existing 15-foot pavement to a new 20-foot width and high standard alignment during the next biennium, which will close July 1, 1933.

FROM LEBEC TO LOS ANGELES

Through Los Angeles County the Golden State Highway is also known as the "Ridge road" due to the fact that it follows in great part between Lebec and a point north of Saugus the higher ridges.

Prior to the beginning of state highway work under the California Highway Commission in 1912, all travel to Los Angeles from the great San Joaquin Valley had to go by way of the Tehachapi route or the

Fort Tejon-Antelope Valley route through Lancaster and Palmdale by way of the Mint Canyon road.

One of the first studies of the Commission was to determine upon the location of a shorter, more direct route into Los Angeles to take care of the even then rapidly increasing volume of traffic from the San Joaquin Valley. Preliminary surveys showed a feasible route from Fort Tejon over what is now known as the Ridge route (Golden State Highway), being about 50 miles shorter between Los Angeles and Bakersfield than the existing Mint Canyon route.

The Pacific Light and Power Company and the General Petroleum Company were then constructing their high power transmission lines and pipe lines in the general location selected for the new Ridge route, and had built narrow construction roads with very sharp curves and steep grades to enable them to deliver supplies, materials and equipment for their construction work. These roads, although entirely unsuitable and unsafe for public use, were of great assistance to the state in establishing survey party camps, and to the state highway contractors in getting in supplies and equipment for the construction of the new highway.

ROAD COMPLETED IN 1919

Grading on this road was begun in 1913 and the original paving finally completed in 1919. The Ridge road, from the bottom of the hill at Castaic post office to the Neenach road north of Sandbergs, 29.56 miles in length, had 671 curves with a total curvature of approximately 35,600 degrees. Of these curves, 261 were of 100-foot radius or less. None of the grades on this Ridge road exceeded 6 per cent, but there were nearly 4 miles of the maximum 6 per cent grade. With the great increase in traffic, including a considerable percentage of slow moving trucks and trailers hauling very heavy loads, the road as originally constructed became inadequate to handle the travel, and the hazard to travel was greatly increased by automobiles trying to pass these slow moving loads on the narrow roadway with so many sharp curves with so small a clear sight distance.

The Highway Commission appropriated funds for the improvement of this road, to reduce this hazard and to facilitate travel by grading on the inside of blind curves and widening the roadbed at dangerous locations. This work has been carried on continuously since it first started at a cost of over \$400,000, and has resulted in greatly facilitating the safer movement of travel. Except for this work, the conditions on this road, the main highway connection between southern and central California, would have become intolerable long ago.

HUGE DAILY TRAVEL

However, the topographical conditions are such that it is impracticable to ever bring the existing Golden State Highway up to the modern standards required for the main highway connection between two rapidly developing empires such as we have in southern California and central and northern California.

Present traffic over the Ridge road, as shown by recent traffic counts, amounts to approximately 3400 vehicles per day on Sundays and 2400 on week days, with a steady growth of traffic from year to year.

THE "ALTERNATE" ROUTE

For the past few years studies and preliminary surveys have been made to find the most direct and practicable route across these mountains, and a location has been made between Castaic school and Gorman, which will be 7.3 miles shorter, and will elim-

inate 1280 feet of adverse grade. It eliminates three summits on the present ridge which cause trouble in heavy snow storms, and has only about 7500 degrees of curvature, or approximately one-fifth of that on the original Ridge road. No curve on the new road will have a radius less than 1000 feet, whereas there were many on the original road with a radius of only 70 feet.

The road will be an expensive one to build, but on account of its great shortening of the distance and with the heavy travel steadily increasing, will more than pay for itself in a short time.

FIRST CONTRACT LET

A contract has recently been awarded for the construction of the first 7 miles of this new route of the Golden State Highway northerly from Castaic school. This is the largest grading contract yet awarded in this district, and probably one of the largest in the state. The estimated grading quantities on this contract are 1,230,000 cubic yards of roadway excavation and 8,530,000 station yards of overhaul. The allotment for this one contract alone is over \$603,000. This first section is being graded 40 feet wide.

The grading on the next section, 5.2 miles long, will be started as soon as funds are available; probably at the beginning of the next biennium.

The present Ridge road from Castaic school to Gormans will be taken over by Los Angeles County and maintained as a county road immediately upon the completion and opening to travel of the new relocated Ridge road.

Minor line changes are proposed between Castaic Junction and one mile northerly, including a relocation across Castaic Creek, which will require the construction of a new bridge. The cost of this improvement is estimated at approximately \$100,000. There will be no great shortening in distance, but considerable improvement in alignment.

NEWHALL TUNNEL ELIMINATION

Another improvement in the old road that is nearly completed is the relocation of the highway between Los Angeles city limits and the Santa Clara River. This realignment eliminates the Newhall Tunnel, which for years has been the "bottleneck" on this portion of the road. This tunnel was built by Los Angeles County about 20 years ago in the early days of the county highway work, and eliminated the old narrow Fremont Pass road with its 28 per cent grade. There is no tunnel on this new road, the saddle being crossed by an open cut nearly 130 feet deep on the center line of the road and about 185 feet deep on the high side.

The new alignment saves approximately one mile in distance, and is on a high type of alignment and grade, thus making a considerable saving in the running time for travel between Los Angeles and Bakersfield, and also between Los Angeles and the easterly end of the Santa Clara Valley. This improvement 8½ miles long has been graded 46 feet wide, and a 30-foot Portland cement concrete pavement will be opened to travel about the middle of July. The cost of this improvement will be nearly \$750,000.

The old Newhall Tunnel road through Newhall and Saugus will still be maintained by the state as a part of the Mint Canyon road, and within the next two or three years the construction of a second tunnel paralleling the existing tunnel is planned so as to adequately take care of the heavy travel on this road.

SANTA CLARA RIVER BRIDGE

The old bridge on the Ridge road over the Santa Clara River, which was built by Los Angeles County

CALIFORNIA SPEEDS

ROAD PROGRAM FAR

BEYOND U. S. AVERAGE

Highway construction throughout the country has been speeded up fully 100 per cent in 1930 as compared with the first three months of 1929, according to the Automobile Club of Southern California, which bases the statement on reports from the governors of 35 states, sent to Secretary of Commerce Lamont. Contracts awarded for the first three months of 1930 amounted to \$114,101,383 as compared with \$50,910,133 for the same period of 1929, a net increase of more than 124 per cent. California increased 181 per cent.

BRAKE TESTING ACTIVITIES

(Continued from page 13.)

before the state patrol officers at the place designated in the citation, together with his car, for a second test. If the second test shows his brakes to be efficient he may thus clear his record.

Motorists are required to comply with section 94 of the Motor Vehicle Act setting up definite standards for brakes. The tests are made with a decelerometer.

It is not the intention of the patrol to be harsh or arbitrary in the matter of brakes. Rather, we hope by persistent enforcement to educate the motorist to the necessity of having his brakes inspected regularly and frequently.

Section 94 of the Motor Vehicle Act makes it unlawful to operate a motor vehicle unless it can be brought to a stop when traveling at given speed in a given distance. The table of speeds and distances set up in the act is as follows:

Miles per hour	Stopping distance
10-----	9.3
15-----	20.8
20-----	37
25-----	58
30-----	83.3

W. E. Glendinning has resigned his position as director of tree planting for the State Highway Commission and has purchased a mercantile business in Fresno. His resignation became effective July 1.

in 1916, was washed out at the time of the flood resulting from the failure of the San Francisco Dam. A new modern bridge over the Santa Clara River and an overhead crossing over the Montalvo branch of the Southern Pacific Railroad were constructed on the alignment of the Newhall cut-off last year.

LIST OF HIGHWAY BIDS AND AWARDS

For Month of June

AMADOR, EL DORADO COUNTIES—Timber bridge across Cosumnes River about 10 miles south of El Dorado. Consist 1-120' through tr. sp. on concrete piers and 9-19' approach spans on fr. bents with concrete pedestals and approximately 14 miles roadway to grade and surface with untreated crushed gravel or stone. Dist. X, Rt. 65, Sec. A, C. M. B. McGowan, San Francisco, \$32,191. Contract awarded to C. E. Force, Piedmont, \$21,795.

BUTTE COUNTY—Between Bardees Creek and Pulga, about 1.8 miles long to be graded. Dist. II, Route 21, Sec. C. The Utah Construction Co., San Francisco, \$293,280; R. H. Travers, Los Angeles, \$372,446; J. G. Donovan & Son, Los Angeles, \$401,622; H. H. Boomer, San Francisco, \$396,802; E. C. Coats, Sacramento, \$359,367; J. F. Shea Co., San Francisco, \$344,087. Contract awarded to Granfield, Farrar and Carlin, San Francisco, \$248,528.

DEL NORTE COUNTY—In Del Norte County in vicinity of the head of Richardson Creek about 0.5 mile to be graded. Dist. I, Route 1, Sec. A, J. E. Johnston, Stockton, \$15,269; Hemstreet & Bell, Marysville, \$13,559; Smith Bros., Eureka, \$13,712. Contract awarded to Englehart Paving and Construction Co., Eureka, \$11,417.

FRESNO AND KINGS COUNTIES—Between Coalinga and Hanford about 45 miles in length, light fuel oil to be applied to shoulders. Dist. VI, Route 10, Secs. D, E, F, B, C. G. M. Duntley, Los Angeles, \$15,834; Gilmore Oil Co., Ltd., Los Angeles, \$18,322; California Road Oil Service Co., Wilmington, \$19,227. Contract awarded to Stewart & Nuss, Inc., Fresno, \$14,363.

IMPERIAL COUNTY—Between Holtville and Sand Hills, about 1.5 miles to have furnished and spreading fuel oil on shoulders. Dist. VIII, Rt. 27, Sec. A. Contract awarded to G. M. Duntley of Los Angeles, \$1,685.72.

KERN COUNTY—Between Grapevine and Delano, and between 7.7 miles and 2.7 miles west of Maricopa, about 69.1 miles of oiling. Dist. VI, Rts. 4 and 57. Fred W. Nighbert, Bakersfield, \$10,195; Gilmore Oil Co., Los Angeles, \$9,821; California Road Oil Service Co., Wilmington, \$10,479. Contract awarded to G. M. Duntley, Los Angeles, \$8,235.

LOS ANGELES COUNTY—Between Citrus Ave. and Glendora 1 mile to be paved with asphaltic concrete. Dist. VII, Rt. 9, Sec. H. P. J. P. J. Akmadzieh, Los Angeles, \$50,115. Contract awarded to Griffith Company of Los Angeles, \$36,319.50.

LASSEN AND MODOC COUNTIES—Between Hillside and Alturas, about 57.2 miles long, furnishing and applying heavy fuel oil. Dist. II, Rt. 28, Sec. A, B. Contract awarded to D. McDonald, Sacramento, \$21,509.45.

MARIN COUNTY—Between San Rafael and Alto, 4.4 miles to be surfaced with bituminous macadam. Dist. IV, Rt. 1, Sec. C, M. J. Bevanda, Stockton, \$104,189; Fredrickson & Watson, Oakland, \$108,780; A. Teichert & Son, Sacramento, \$117,121; C. W. Wood, Stockton, \$98,607; Heavey-Moore Co., Oakland, \$11,570; Arrs-Knapp Co., Oakland, \$114,825. Contract awarded to Granfield, Farrar and Carlin, San Francisco, \$94,892.50.

MONTEREY COUNTY—Bridge across Salinas River at Bradley, consisting of six 140-ft. steel deck truss spans, concrete deck on concrete piers with pile foundations; and eighteen 45-ft. reinforced concrete girder spans on concrete bents with pile foundations. Dist. V, Rt. 2, Sec. I. Rocca & Calletti, San Rafael, \$257,380; R. H. Travers, Los Angeles, \$262,915; Ward Engineering Co., San Francisco, \$268,897; J. F. Knapp, Oakland, \$269,216; Geo. Pollock Co., Sacramento, \$265,328; Siems-Helmers, Inc., San Francisco, \$308,146; Jasper-Stacy Co., San Francisco, \$336,178; Healy-Tibbitts Const. Co., San Francisco, \$314,267; M. B. McGowan, San Francisco, \$267,967. Contract awarded to H. E. Doering, Yreka, \$256,563.

NEVADA COUNTY—Overhead crossing over the S. P. tracks near Yuba Pass on the Victory Highway. Dist. III, Rt. 37, Sec. A. Lindgren & Swinerton, Inc., Sacramento, \$59,458; Ward Engineering Co., San Francisco, \$59,308; M. G. McGowan, San Francisco, \$60,593; T. E. Connolly, San Francisco, \$65,564. Contract awarded to Bodenhamer Construction Co., San Diego, \$55,751.75.

NEVADA COUNTY—Reinforced concrete bridge across the South Fork of the Yuba River near Indian Springs on the Victory Highway. Dist. III, Rt. 37, Sec. A. Ward Engineering Co., San Francisco, \$17,355; M. B. McGowan, San Francisco, \$16,740; T. E. Connolly, San Francisco, \$18,110. Contract awarded to Alturas Construction Co., Sacramento, \$13,935.

PLACER COUNTY—Subway crossing under the S. P. R. R. tracks near Emigrant Gap, Victory Highway. Dist. III, Rt. 37, Sec. E. Ward Engineering Co., San Francisco, \$58,891; T. E. Connolly, San Francisco, \$61,764. Contract awarded to Lord & Bishop, Sacramento, \$57,816.

NEVADA-PLACER COUNTY—Between South Fork of the Yuba River and Soda Springs, about 10.8 miles to be surfaced with crusher run base and untreated crushed gravel or stone. Dist. III, Rt. 37, Sec. A, F, B. Hein Bros. and Basalt Rock Co., Petaluma, \$238,715; A. Teichert & Son, Sacramento, \$211,633; Isbell Const. Co., Fresno, \$245,786; Geo. Pollock Co., Sacramento, \$227,558; Charles Harlowe, Jr., Oakland, \$164,398; J. P. Holland, Inc., San Francisco, \$220,524; Englehart Paving Co., Eureka, \$205,246. Contract awarded to Hemstreet & Bell, Marysville, \$157,089.

RIVERSIDE COUNTY—Between Whitewater River Bridge and Indio about 29 miles long, furnishing and applying heavy fuel oil to shoulders. Dist. VIII, Rt. 26, Secs. D, E. Gilmore Oil Co., Los Angeles, \$45,934; G. M. Duntley, Los Angeles, \$43,261. Contract awarded to California Road Oil Service Co., Wilmington, \$42,167.44.

SAN BERNARDINO COUNTY—Between Cronese and E. boundary, 71.8 miles furnishing and applying heavy fuel oil. Dist. VIII, Rt. 31, Secs. J, K, L, M, N. P. California Road Oil Service Co., Wilmington, \$24,501; G. M. Duntley, Los Angeles, \$28,979. Awarded to Gilmore Oil Co., Ltd., Los Angeles, \$18,484.95.

SAN JOAQUIN COUNTY—Between South Banta Road and East Banta Road, 1.9 miles to be graded and paved with asphalt concrete. Dist. X, Rt. 5, Sec. B. C. W. Wood, Stockton, \$58,484; J. E. Johnson, Stockton, \$57,688; Valley Paving and Const., Visalia, \$56,508. Contract awarded to Heavey-Moore Co., Oakland, \$51,144.30.

SAN JOAQUIN COUNTY—Between French Camp and Stockton, 1.8 miles grading and surfacing with crushed gravel or stone, untreated. Dist. X, Rt. 4, Sec. B. Fredrickson & Watson Const. Co., Oakland,

\$50,248; Gannon and McCarty, Stockton, \$53,629; George Pollock Co., Sacramento, \$43,201; C. W. Wood, Stockton, \$46,183; D. McDonald, Sacramento, \$54,086; Kennedy-Bayles Const. Co., Biggs, \$64,030; A. Teichert & Son, Sacramento, \$55,881; Pereira & Reed, Tracy, \$47,144; Lilly, Willard & Biasotti, Stockton, \$43,055; R. G. Le Tournear, Stockton, \$49,465. Contract awarded to Larsen Bros., Galt, \$42,828.90.

SAN JOAQUIN COUNTY—Between Honston School and Forest Lake, 3.3 miles to be graded and widened with Portland cement concrete and crusher run base. Dist. X, Rt. 4, Sec. D. C. W. Wood, Stockton, \$38,960; T. M. Morgan Paving Co., Los Angeles, \$43,487; Heafey-Moore Co., Oakland, \$49,592. Contract awarded to Larsen Bros., Galt, \$38,726.65.

SAN LUIS OBISPO COUNTY—Between Estrella River and Sacramento Ranch, about 5.9 miles to have seal coat applied to existing bituminous surfacing. Dist. V, Rt. 33, Sec. B. A. Teichert & Son, Sacramento, \$5,780; M. J. Bevanda, San Luis Obispo, \$6,998. Contract awarded to Granite Construction Co., Watsonville, \$5,744.

SANTA CLARA COUNTY—Between San Antonio Ave. and Sunnyvale, 4.9 miles to be graded and paved with Portland cement concrete and asphalt concrete. Dist. IV, Rt. 2, Sec. A. N. M. Ball, Porterville, \$210,045; A. J. Raisch, San Jose, \$209,771; Union Paving Co., San Francisco, \$208,986; Central California Roads Co., Oakland, \$233,386. Contract awarded to Hanrahan Co., San Francisco, \$204,904.10.

SANTA CRUZ COUNTY—Between Waterman Switchback and Saratoga Gap, 2.6 miles to be graded and surfaced with bituminous treated waterbound macadam. Dist. IV, Rt. 42, Sec. A. M. J. Bevanda, Stockton, \$156,052; W. A. Dantonville, Salinas, \$178,033; Granfield, Farrar & Carlin, San Francisco, \$157,201; J. P. Holland, Inc., San Francisco, \$139,641; C. R. Johnson, San Francisco, \$166,729; R. H. Travers, Los Angeles, \$144,043; Geo. Pollock Co., Sacramento, \$167,064; Kennedy-Bayles Const. Co., \$179,893; Arris-Knapp Co., Oakland, \$153,484. E. C. Coats, Sacramento, \$130,258. Contract awarded to O. A. Lindberg, Stockton, \$127,229.10.

SHASTA COUNTY—Bridge across Salt Creek, consisting of one 60' pony truss span on concrete piers and six 19' approach spans on frame bents with concrete pedestals. Dist. II, Rt. 28, Sec. A. Alturas Const. Co., Sacramento, \$14,111; C. Emil Force, Piedmont, \$14,921; H. C. Whitty, Sanger, \$15,244; Smith Bros. Co., Eureka, \$14,539; J. P. Brennan, Redding, \$13,439; Contract awarded to R. B. McKenzie, Red Bluff, \$12,544.70.

SHASTA AND LASSEN COUNTIES—Between Fall River Mills and Big Valley, about 17.9 miles in length to be graded and surfaced with untreated crushed gravel or stone. Dist. II, Rt. 28, Sec. E. A. Granfield, Farrar & Carlin, San Francisco, \$351,531. Isbell Construction Co., Fresno, \$339,938; Jasper & Stacy Co., San Francisco, \$234,039. Contract awarded to Mathews Construction Co., Sacramento, \$278,250.80.

SHASTA AND TRINITY COUNTIES—Between Tower House and Greenhorn, 5.2 miles; between Ashers and Montgomery Creek, 12.3 miles; between Haynes Ranch and Fall River, 24.1 miles; between Grass Valley Creek and Weaverville about 17.1 miles—furnishing and applying heavy fuel oil to roadbed. Dist. II, Rts. 20 and 28, Secs. A, B, D and A, B, J. A. Casson, Hayward, \$20,080; D. McDonald, Sacramento, \$20,582. Contract awarded to Basalt Rock Co., Inc., Napa, \$19,126.20.

SISKIYOU COUNTY—Between Shasta River and Walker a distance of about 21 miles, heavy fuel oil to be furnished and applied as dust layer. Dist. II, Rt. 46, Sec. D. Contract awarded to Basalt Rock Co., Napa, \$6,547.20.

SONOMA COUNTY—Between Boltane and Shellville, 3.9 miles furnishing and applying asphaltic road oil. Dist. IV, Rt. 51, Sec. B. Geo. French, Jr., Stockton, \$2,420; Basalt Rock Co., Inc., Napa, \$2,550. Awarded to A. Teichert & Son, Sacramento, \$2,280.

SONOMA AND MENDOCINO COUNTIES—Between Cloverdale and Hopland, 12.5 miles to be furnished and applied with asphaltic road oil. Dist. IV, Rt. 1, Sec. A. Basalt Rock Co., Napa, \$7,350; Highway Builder, Ltd., San Anselmo, \$7,650. Contract awarded to A. Teichert & Son, Sacramento, \$6,975.

TEHAMA, PLUMAS AND LASSEN COUNTIES—Between Dales and Coppervale, 51.1 miles heavy fuel oil to be furnished and applied as dust layer. Dist. II, Rt. 29, Secs. A, B, C and A. Basalt Rock Co., Inc., Napa, \$14,250; D. McDonald, Sacramento, \$15,983. Contract awarded to A. Teichert & Son, Inc., Sacramento, Cal., \$13,727.50.

TEHAMA AND SHASTA COUNTIES—Between 1 mile south of Cottonwood and Cottonwood, an under-grade crossing and 0.9 of a mile roadway graded and paved with Portland cement concrete. Dist. II, Rt. 3, Sec. C. A. Fredrickson & Watson Const. Co., Oakland, \$149,565; Ward Engineering Co., San Francisco, \$136,006; Dunn & Baker, Klamath Falls, \$150,134; Jasper-Stacy Co., San Francisco, \$152,783; Rocca and Caletti, San Rafael, \$139,050; Lindgren & Swinerton, Sacramento, \$200,943. Contract awarded to C. W. Wood, Stockton, \$135,058.

TULARE, MADERA, FRESNO AND KINGS COUNTIES—Various portions amounting to 102.6 miles light fuel oil to be furnished and applied to shoulders. Dist. VI, Rts. 4 and 10. Visalia Transfer & Storage Co., Visalia, \$12,012; Gilmore Oil Co., Los Angeles, \$13,446; California Road Oil Service Co., Wilmington, \$13,695. Contract awarded to G. M. Duntley, Los Angeles, \$11,620.

WATER APPLICATIONS AND PERMITS

Applications for permit to appropriate water filed with the State Department of Public Works Division of Water Resources during the month of June, 1930.

TRINITY COUNTY—Application 6690. C. M. Salyer, c/o C. A. Paulsen, Weaverville, Cal., for 25 c.f.s. from Hawkins Creek tributary to Trinity River to be diverted in Sec. 15, T. 6 N., R. 6 E., H. M., for mining and domestic purposes. Estimated cost \$5,000.

PLUMAS COUNTY—Application 6691. J. W. McKay and Merritt J. Reid, Meadow Valley, Cal., for 13,000 gallons per day from Deadwood Creek tributary to Spanish Creek to be diverted in Sec. 29, T. 24 N., R. 8 E., M. D. M., for mining and domestic purposes. Estimated cost \$200.

MONO COUNTY—Application 6692. Henry Heyman, 222 West 25th St., Long Beach, Cal., for 200 gallons per day from Rock Creek tributary to Owens River to be diverted in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$300.

MODOC COUNTY—Application 6693. Robert O. Fink, Cedarville, Cal., for 0.62 c.f.s., from Thomas Creek tributary to North Fork Pit River to be diverted in Sec. 28, T. 43 N., R. 15 E., M. D. M., for irrigation

and domestic purposes on 50 acres. Estimated cost \$50.

HUMBOLDT COUNTY—Application 6694 Chas. E. Snider & Walter Wilson, c/o Chas. E. Snider, 812 Mills Bldg., San Francisco, Cal., for 300 c.f.s., from Slate Creek tributary to Klamaath River to be diverted in Sec. 7, T. 10 N., R. 5 E., H. M., for mining purposes. Estimated cost \$50,710.

SAN BERNARDINO COUNTY—Application 6695. Robert S. Irwin, Lucerne Valley, Cal., for 0.5 c.f.s., from 2 unnamed springs tributary to unnamed waterway, thence Mojave Desert to be diverted in Sec. 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic purposes on 40 acres. Estimated cost \$3,600.

COLUSA COUNTY—Application 6696. J. W. Browning, c/o Thos. Rutledge, Colusa, Cal., for 5.95 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 6, T. 14 N., R. 1 E., M. D. M., for irrigation purposes on 476.2 acres. Estimated cost \$6,690.

BUTTE COUNTY—Application 6697. H. N. Dalley, c/o Polk & Robinson, Chico, Cal., for 2.0 c.f.s., from Middle Butte Creek tributary to Sacramento River to be diverted in Sec. 34, T. 23 N., R. 3 E., M. D. M., for mining and domestic purposes. Estimated cost \$500.

SISKIYOU COUNTY—Application 6698. Fred J. Blakeley, c/o Butler, Van Dyke, Desmond and Harris, Attorneys, P. O. Box 1114, Sacramento, Cal., for 25 c.f.s., and 4000 acre-feet per annum from Elliott Creek tributary to Applegate River to be diverted in Sec. 24, T. 48 N., R. 10 W., M. D. M., for irrigation and domestic purposes. Estimated cost \$30,000.

BUTTE COUNTY—Application 6699. Harvey C. Adams, Chico, Cal., for 7.5 c.f.s. from Drainage Ditch from Drainage District No. 2, tributary to Butte Creek and Sacramento River to be diverted in Sec. 27, T. 19 N., R. 1 E., M. D. M., for irrigation purposes, 700 acres. Estimated cost \$1,500.

BUTTE COUNTY—Application 6700. Harvey C. Adams, Chico, Cal., for 3 c.f.s., from Drainage Ditch from Drainage District No. 2, tributary to Butte Creek and Sacramento River to be diverted in Sec. 28, T. 19 N., R. 1 E., M. D. M., for irrigation purposes on 120 acres.

NEVADA COUNTY—Application 6701. Nevada Irrigation District, c/o Fred H. Tibbetts, Chief Engineer, 1320 Alaska Commercial Bldg., San Francisco, Cal., for (1) 15 c.f.s., from (1) Fall Creek, (2) S. Fork Fall Creek tributary to South Fork Yuba River to be diverted in Sec. (1a) 36, T. 18 N., R. 11 E., M. D. M., Sec. (1b) 6, T. 17 N., R. 12 E., M. D. M., for power purposes. Estimated cost \$450,000.

NEVADA COUNTY—Application 6702. Nevada Irrigation District, c/o Fred H. Tibbetts, Chief Engineer, 1320 Alaska Commercial Bldg., San Francisco, Cal., for (1) 15 c.f.s., and (2) 5 c.f.s., from (1) Fall Creek, (2) S. Fork Fall Creek tributary to be diverted in Sec. (1a) 36, T. 18 N., R. 11 E., M. D. M., Sec. (1b) and (2) 6, T. 17 N., R. 12 E., M. D. M., for irrigation purposes on 167,789 acres. Estimated cost \$450,000.

SHASTA COUNTY—Application 6703. Lambert Dost, 3835 S. Vermont Ave., Los Angeles, Cal., for 0.25 c.f.s. from 2 unnamed springs and unnamed creek tributary to Churn Creek, thence Sacramento River to be diverted in Sec. 12, T. 32 N., R. 5 W., M. D. M., for domestic and irrigation purposes on 20 acres.

LAKE COUNTY—Application 6704. Martin Judge, Jr., & Co., Crocker First Nat'l Bank Bldg., San Francisco, Cal., for 250 c.f.s., and 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated cost \$3,000,000.

LAKE COUNTY—Application 6705. Martin Judge, Jr., & Co., Crocker First Nat'l Bank Bldg., San Francisco, Cal., for 175,000 acre-feet per annum from North Fork of Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation on 50,000 acres. Estimated cost \$1,000,000.

SAN BERNARDINO COUNTY—Application 6706. George Tillitt, Highland, Cal., for 0.003 (or approx. 1950 gallons per day) from unnamed spring tributary to Green Valley Creek, thence Deep Creek, thence Mojave River to be diverted in Sec. 23, T. 2 N., R. 2 W., S. B. M., for domestic purposes. Estimated cost \$560.

ALAMEDA COUNTY—Application 6707. East Bay Municipal Utility District, c/o T. P. Wittschen, Atty., 1406 Latham Square Bldg., Oakland, Cal., for 42 c.f.s. and 41,436 acre-feet per annum from San Leandro, Kiser, Redwood, Moraya, Kings, Reiley's and Perez Creek tributary to San Leandro Bay to be diverted in Sec. 6, T. 2 S., R. 2 W., M. D. M., for municipal purposes. Estimated cost \$1,377,000.

VENTURA COUNTY—Application 6708. W. S. Dunshee, Edward M. & John L. Selby, Ventura, Cal., for 100 acre-feet per annum from Cayote Creek tributary to Ventura River to be diverted in Sec. 15, T. 4 N., R. 24 W., S. B. M., for recreational and domestic purposes. Estimated cost \$50,710.

VENTURA COUNTY—Application 6709. Edward M. & John L. Selby, R. D. No. 1, Ventura, Cal., for 0.067 c.f.s. from Mountain Spring tributary to North Fork Cayote Creek, thence Cayote Creek, thence Ventura River to be diverted in Sec. 15, T. 4 N., R. 24 W., S. B. B. & M., for domestic purposes. Estimated cost \$2,000.

GLENN COUNTY—Application 6710. Eugene K. REYNOLDS, Elk Creek, Cal., for 0.06 c.f.s., from Stony Creek tributary to Sacramento River to be diverted in Sec. 27, T. 21 N., R. 6 W., M. D. M., for irrigation 6 A. purposes. Estimated cost \$250.

STANISLAUS AND MERCED COUNTIES—Application 6711. Turlock Irrigation District, c/o R. V. Merkle, Chief Engineer, 117 West Main St., Turlock, Cal., for 800 c.f.s. from Tuolumne River tributary to San Joaquin River to be diverted in Sec. 16, T. 3 S., R. 14 E., M. D. M., for irrigation purposes.

SAN JOAQUIN COUNTY—Application 6712. Frank Piccardi, Carlo Morzone, Angelo Calcagno and C. Farani, 109 E. Weber St., Stockton, Cal., c/o L. B. Raab, for 0.92 c.f.s. from San Joaquin River tributary to Suisun Bay to be diverted in Sec. 5, T. 1 S., R. 8 E., M. D. M., for irrigation and domestic purposes on 73.7 acres. Estimated cost \$30,000.

INYO COUNTY—Application 6713. Ada Norris, P. O. Box 2, Trona, Cal., for 0.50 c.f.s., from Spring in Pleasant Canyon tributary to Panamint Valley Watershed to be diverted in Sec. 12, T. 22 S., R. 44 E., M. D. M., for mining and domestic purposes.

SAN BERNARDINO COUNTY—Application 6714. Mary Francis Bird, B Bar B Ranch, Victorville, Cal., for 0.25 c.f.s., from Ruby Springs, Ruby Canyon tributary to Mojave Desert to be diverted in Sec. 5, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic purposes on 15 acres. Estimated cost \$20.

SHASTA COUNTY—Application 6715. J. J. Vokal et al., c/o Mr. Roscoe J. Anderson, Suite 25, P. O. Building, Redding, Cal., for 7 c.f.s., from Olney Creek including foreign and natural flow tributary to Sacramento River to be diverted in Sec. 27 of Rancho Bueno Ventura, P. B. Reading Grant, for power purposes. Estimated cost \$250.

SHASTA COUNTY—Application 6716. J. J. Vokal et al., c/o Mr. Roscoe J. Anderson, Suite 25, P. O. Building, Redding, Cal., for 0.50 c.f.s., from Olney Creek including foreign and natural flow tributary to Sacramento River to be diverted in Sec. 27 of Rancho Bueno Ventura, P. B. Reading Grant, for irrigation and domestic purposes. Estimated cost \$250.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN BERNARDINO COUNTY—Permit 3492, Application 6435. Issued to J. F. Gore, Beverly Hills, Cal., June 5, 1930, for 0.1 c.f.s. from unnamed spring in Sec. 26, T. 1 N., R. 3 W., S. B. M., for irrigation on 40 acres. Estimated cost \$750.

TRINITY COUNTY—Permit 3493, Application 6564. Issued to A. J. Norcott and W. H. Dudley, Burnt Ranch, Cal., June 5, 1930, for 0.48 c.f.s. from unnamed spring in Sec. 34, T. 6 N., R. 6 E., M. D. M., for mining, water to be returned to Trinity River. Estimated cost \$500.

INYO COUNTY—Permit 3494, Application 6599. Issued to J. F. Chrysler and P. H. Cook, Lone Pine, Cal., June 6, 1930, for 0.025 c.f.s. from Carrol Creek in Sec. 31, T. 16 S., R. 36 E., M. D. M., for irrigation and domestic use on 20 acres. Estimated cost \$300.

INYO COUNTY—Permit 3495, Application 5073. Issued to H. W. Eichbaum, Avalon, Cal., June 19, 1930, for 0.008 c.f.s. from Lower Spring in Emigrant Canyon in Sec. 29, T. 17 S., R. 44 E., M. D. M., for domestic use. Estimated cost \$150.

INYO COUNTY—Permit 3496, Application 5336. Issued to H. W. Eichbaum, Darwin, Cal., June 19, 1930, for 0.001 c.f.s. from unnamed seepage water in Sec. 30, T. 16 S., R. 45 E., M. D. M., for domestic use. Estimated cost \$3,000.

DEL NORTE COUNTY—Permit 3497, Application 6453. Issued to E. F. Raymond, Crescent City, Cal., June 21, 1930, for 5 c.f.s. from Patrick's Creek in Sec. 2, T. 17 N., R. 3 E., H. M., for power. Estimated cost \$1,500.

EL DORADO COUNTY—Permit 3498, Application 6556. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsen Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for mining. Estimated cost \$2,000.

EL DORADO COUNTY—Permit 3499, Application 6557. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsen Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for irrigation of 10 acres. Estimated cost \$2,000.

EL DORADO COUNTY—Permit 3500, Application 6558. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsen Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for Recreational and Domestic. Estimated cost \$2,000.

INYO COUNTY—Permit 3501, Application 5286. Issued to J. Irving Crowell, R. F. D. No. 1, Box 60, Van Nuys, Cal., June 24, 1930, for 0.025 c.f.s. from Keane Springs in SE $\frac{1}{4}$ projected Sec. 6, T. 30 N., R. 1 E., for mining, milling and domestic. Estimated cost \$7,000.

SUTTER COUNTY—Permit 3502, Application 6664. Issued to James R. Sutter Cranmore, Sutter Co., Cal., June 24, 1930, for 1.94 c.f.s. from Sacramento River in NE $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 14, T. 13 N., R. 1 E., M. D. M., for irrigation 154.967 acres. Estimated cost \$5,000.

RIVERSIDE COUNTY—Permit 3503, Application 4752. Issued to Palm Valley Water Co., c/o C. L. McFarland, Atty., Suite 3, 4 & 5, Evans Block, Riverside, Cal., June 25, 1930, for 1.5 c.f.s. from Snow Creek, in NW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 33, T. 3 S., R. 3 E., S. B. M., for domestic use. Estimated cost \$81,000.

SISKIYOU COUNTY—Permit 3504, Application 6436. Issued to Charles Wilton Pay, 4131 Lincoln Ave., Oakland, Cal., June 25, 1930, for 3.0 c.f.s. from Mill Creek in SE $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 25, T. 18 N., R. 6 E., H. M., for mining and domestic use. Estimated cost \$75.

SONOMA COUNTY—Permit 3505, Application 6512. Issued to Joe M. Fernandez, Ed. 490, Sonoma, Cal., June 26, 1930, for 0.22 c.f.s. from Sonoma Creek in SW $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 13, T. 5 N., R. 6 W., M. D. M., for irrigation. Estimated cost \$825.

MONO COUNTY—Permit 3506, Application 6129. Issued to Thomas H. McKee, Bishop, Cal., June 26, 1930, for 3000 gallons per day from unnamed spring in SW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 14, T. 2 S., R. 26 E., M. D. M., for domestic use. Estimated cost \$350.

TUOLUMNE COUNTY—Permit 3507, Application 6129. Issued to Sierra and S. F. Power Co., c/o P. M. Downing, Ist V. P. and G. M., P. G. & E. Co., 245 Market St., San Francisco, Cal., June 27, 1930, for 5360 acre-feet per annum from South Fork Stanislaus River in SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 24, T. 3 N., R. 16 E., M. D. M., for power (3382 T. H. P.). Estimated cost \$380,000.

TUOLUMNE COUNTY—Permit 3508, Application 6130. Issued to Sierra and S. F. Power Co., c/o P. M. Downing, Ist V. P. and G. M., P. G. & E. Co., 245 Market St., San Francisco, Cal., June 27, 1930, for 5360 acre-feet per annum from S. Fork Stanislaus River in SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 24, T. 3 N., R. 16 E., M. D. M., for irrigation and domestic, 3500 acres. Estimated cost \$380,000.

PLACER COUNTY—Permit 3509, Application 6540. Issued to Mrs. Eva Harness and R. Longley, Loomis, Cal., June 28, 1930, for 0.26 c.f.s. from Secret Ravine in SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 10, T. 11 N., R. 7 E., M. D. M., for irrigation, 37 acres. Estimated cost \$850.

DAM APPLICATIONS, APPROVALS AND PLANS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN MATEO AND SANTA CLARA COUNTIES—Lagunita Dam No. 614-3. Leland Stanford Jr. University, Stanford University, California, owner; earth-fill, 31 feet high with a storage capacity of 260 acre-feet, situated on no stream tributary to San Francisco Bay in Sec. 10, T. 6 S., R. 3 W., M. D. M., for storage purposes for irrigation and recreation use.

YUBA COUNTY—St. Louis Dam No. 331. Loftus Blue Lead Mines Company, Los Angeles, California, owner; arch, 55 feet above streambed, situated on State Creek tributary to North Fork of Yuba River in Sec. 11, T. 20 N., R. 8 E., M. D. M., for storage purposes for debris use. Estimated cost \$45,000.

SIERRA COUNTY—Huntington Flat A & B Dams Nos. 331-2. Loftus Blue Lead Mines Co., Los Angeles, California, owner; earthfill, 15 feet in height with storage capacity of 60 acre-feet, situated on no stream in Sec. 7, T. 21 N., R. 10 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Mose Emery Dam No. 331-3. Loftus Blue Lead Mines Company, Los Angeles, California, owner; earthfill, 20 feet above streambed with a storage capacity of 8 acre-feet, situated on a gulch tributary to Cedar Grove Ravine in Sec. 12, T. 21 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Gardner's Point Dam No. 331-4. Loftus Blue Lead Mines Company, Los Angeles, California, owner; earthfill, 7 feet high with a storage capacity of 60 acre-feet, situated on no stream in Sec. 13, T. 21 N., R. 9 E., M. D. M., for storage purposes for mining use.

SACRAMENTO COUNTY—Alder Creek Dam No. 453. Natomas Company, Sacramento, California, owner; earthfill, 12 feet above streambed with a storage capacity of 8 acre-feet, situated on Alder Creek tributary to American River in Sec. 15, T. 9 N., R. 7 E., M. D. M., for storage purposes for irrigation use.

PLUMAS COUNTY—Eureka Lake Dam No. 283. Plumas Eureka Corporation, Johnsville, California, owner; earthfill, 20 feet above streambed with a storage capacity of 400 acre-feet, situated on no stream tributary to Jamison Creek in Sec. 23, T. 22 N., R. 11 E., M. D. M., for storage purposes for power and mining use.

SAN DIEGO COUNTY—Harrison Dam No. 844. R. E. Harrison, San Diego, California, owner; earthfill, 14 feet above streambed, situated on McCain Creek in Sec. 22, T. 17 S., R. 7 E., S. B. M., for storage purposes for recreation use. Estimated cost \$2,500.

RIVERSIDE COUNTY—Stansbury Dam No. 819. Corona Heights Water Company, Los Angeles, California, owner; earthfill, situated on a pipe line tributary to no stream, located in Lot 316, Corona Heights for storage purposes for domestic and irrigation use.

SIERRA COUNTY—Lower Spencer Lake Dam No. 298. William Hood, Berkeley, California, owner; earth and rock fill, 24 feet above streambed with a storage capacity of 300 acre-feet, situated on Lower Spencer Lake tributary to Yuba River for storage purposes for power use.

SIERRA COUNTY—Upper Spencer Lake Dam No. 298-2. William Hood, Berkeley, California, owner; rock and earth fill, 4 feet above streambed with a storage capacity of 25 acre-feet, situated on Upper Spencer Lake, tributary to Yuba River for storage purposes for power use.

SAN MATEO COUNTY—Burlingame Dam No. 611. Pacific Water Company, San Mateo, California, owner; earthfill, 50 feet above streambed with a storage capacity of 91 acre-feet, situated on a dry creek, tributary to San Francisco Bay, located in San Mateo Rancho for storage and diversion purposes. Estimated cost \$30,000.

SAN MATEO COUNTY—Cowell Dam No. 615—I. M. H. E. & S. H. Cowell, San Francisco, California, owners; earthfill, 30 feet above streambed, situated on Denison Creek tributary to Pacific Ocean, located on Rancho Canal de Tierra for storage purposes for irrigation use.

MONTEREY COUNTY—Black Rock Creek Dam No. 643. Monterey Game and Stock Association, Monterey, California, owner; earth and rock fill, 30 feet above streambed with a storage capacity of 30 acre-feet, situated on North Fork of Black Rock Creek tributary to Carmel River in Sec. 32, T. 17 S., R. 2 E., M. D. M., for storage purposes for recreation use. Estimated cost \$23,000.

ORANGE COUNTY—North Lambert Dam No. 793A. The Irvine Company, Tustin, California, owner; earth-fill dam, 12 feet above streambed with a storage capacity of 200 acre-feet situated on no stream, located in Lot 368, Irvine's subdivision for storage purposes for irrigation use. Estimated cost \$4,400.

ORANGE COUNTY—South Lambert Dam No. 793B. The Irvine Company, Tustin, California, owner; earthfill, 112 feet above streambed with a storage capacity of 200 acre-feet, situated on no stream, located in Lot 368 of Irvine's subdivision for storage purposes for irrigation use. Estimated cost \$3400.

CALAVERAS COUNTY—Moosehead Dam No. 493—Franklin Baldwin, Los Angeles California, owner;

arch, 23 feet above streambed with a storage capacity of 120 acre-feet, situated on McKinney's Creek tributary to Calaveritas Creek in Sec. 14, T. 4 N., R. 13 E., M. D. M., for storage purposes, for debris use. Estimated cost \$8,500.

SIERRA COUNTY—Poverty Hill Dam No. 296. J. M. Stiles, Shreveport, Louisiana, owner; earthenfill, 17 feet high with a storage capacity of 200 acre-feet, situated on no stream in T. 20, R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Cleveland Reservoir Dam No. 296-2. W. P. Stiles, Shreveport, Louisiana, owner; earthenfill, 13 feet above streambed with a storage capacity of 150 acre-feet, situated on Rock Creek tributary to Canyon Creek in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Fairplay, Upper Dam No. 296-3. W. P. Stiles, Shreveport, Louisiana, owner; earthenfill, 20 feet above streambed with a storage capacity of 50 acre-feet, situated on no stream in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Fairplay, Lower Dam No. 296-4. W. P. Stiles, Shreveport, Louisiana, owner; earthenfill, 18 feet above streambed with a storage capacity of 12 acre-feet, situated on no stream in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

NAPA COUNTY—Napa Upper No. 3 Dam No. 1-9. Napa State Hospital, Inola, California, owner; earthenfill, 32 feet above streambed with a storage capacity of 10 acre-feet, situated on unnamed canyon in T. 5 N., R. 4 W., M. D. M., for storage purposes for irrigation use.

SIERRA COUNTY—Gold Run Dam No. 297. Judson Estate Company, San Francisco, California, owner; earthenfill, 20 feet above streambed with a storage capacity of 20 acre-feet, situated on Gold Run tributary to Slate Creek and Yuba River in Sec. 29, T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

MENDOCINO COUNTY—Mendocino Lower Dam No. 1-2. Mendocino State Hospital, Talmage, California, owner; concrete, 16 feet above streambed, situated on South Mill Creek, tributary to Russian River in Sec. 25, for storage purposes for domestic use.

LOS ANGELES COUNTY—Clear Creek Dam No. 32-17. Los Angeles County Flood Control District, Los Angeles, California, owner; arch, 20½ feet above streambed, situated on Clear Creek tributary to Big Tujunga Creek in Sec. 1, T. 2 N., R. 13 W., S. B. M., for storage purposes for domestic use.

LOS ANGELES COUNTY—Lower Big Dalton Dam No. 32-18. Los Angeles County Flood Control District, Los Angeles, California, owner; concrete, 52 feet above streambed with a storage capacity of 31½ acre-feet situated on Big Dalton Creek tributary to Walnut Creek in Sec. 15, T. 1 N., R. 9 W., S. B. M., for storage purposes for flood control and debris use.

Applications for approval of plans and specifications for the construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN MATEO COUNTY—Bear Gulch Dam No. 613. Bear Gulch Water Company, Menlo Park, California, owner; clayfill, 56 feet above streambed with a storage capacity of 672 acre-feet situated in depression in hills west of Menlo Park in T. 6 S., R. 4 W., M. D. M., for storage purposes for domestic use. Estimated cost \$73,000. Fees paid \$730.

HUMBOLDT COUNTY—Benbow Dam No. 106. Benbow Power Company, Benbow, California, owner; Ambursen, 17½ feet above streambed with a storage capacity of 78 acre-feet situated on South Fork of Eel River tributary to Eel River in Sec. 36, T. 4 S., R. 3 E., H. M., for storage purposes for power use. Estimated cost \$45,000. Fees paid \$450.

EL DORADO COUNTY—Webber Creek Dam No. 53-3. El Dorado Irrigation District, Placerville, California, owner; earthenfill, 147 feet above streambed with a storage capacity of 6000 acre-feet, situated on Webber Creek tributary to American River in Sec. 18, T. 10 N., R. 12 E., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$300,000. Fees paid \$2,000.

MODOC COUNTY—Long Branch Canyon Dam No. 159. J. Householder, Davis Creek, California, owner; earth and rock fill, 12 feet above streambed with a storage capacity of 400 acre-feet, situated on Long Branch Canyon tributary to Goose Lake in Sec. 26,

T. 47 N., R. 12 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1000. Fees paid \$20.

Plans and specifications for the repair or alteration of dams filed by the State Department of Public Works, Division of Water Resources during the month of June, 1930.

NEVADA COUNTY—Fuller Lake Dam No. 97-21. Pacific Gas and Electric Company, San Francisco, California, owner; earthenfill, situated on Jordan Creek tributary to South Fork of Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M. Nature of repairs: New outlet; gunite slab on upstream face.

SAN MATEO COUNTY—Emerald Lake No. 1, Lower Dam No. 612. Emerald Lake Country Club, San Mateo, California, owner; earthenfill, situated in a small valley tributary to Redwood Creek, located 2½ miles southwest of Redwood City. Nature of repairs: Earth fill on downstream face and install new spillway.

SAN MATEO COUNTY—Emerald Lake No. 3 Dam No. 612-2. Leonard & Holt, San Francisco, California, owner; earthenfill, situated on no creek, located 2½ miles west of Redwood City. Nature of replace: Install water tight core.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN MATEO COUNTY—Bear Gulch Dam No. 613. Bear Gulch Water Company, Menlo Park, California, owner; rolled clay, 56 feet above streambed with a storage capacity of 672 acre-feet, situated in a depression in hills west of Menlo Park, located in Rancho Alameda de Los Pulgas for storage purposes for domestic use. Estimated cost \$73,000.

EL DORADO COUNTY—Webber Creek Dam No. 53-3. El Dorado Irrigation District, Placerville, California, owner; earthenfill, 147 feet above streambed with a storage capacity of 6000 acre-feet, situated on Webber Creek tributary to American River in Sec. 18, T. 10 N., R. 12 E., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$300,000.

AMADOR COUNTY—Allen Dam No. 1-12. Preston School of Industry, Waterman, California, owner; reinforced concrete, 21 feet above streambed with a storage capacity of 2½ acre-feet situated on Downes Ditch in Sec. 27, T. 6 N., R. 10 E., M. D. M., for storage purposes for domestic use. Estimated cost \$10,120.

Plans and specifications for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources during the month of June, 1930.

NEVADA COUNTY—Fuller Dam No. 97-21. Pacific Gas and Electric Company, San Francisco, California, owner; earthenfill, situated on Jordan Creek tributary to South Fork of Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M. New outlet pipe and gate; gunite upstream face.

SAN MATEO COUNTY—Emerald Lake No. 1 Dam No. 612. Emerald Lake Country Club, Redwood City, California, owner; earthenfill, situated on a small valley tributary to Redwood Creek, located 2½ miles southwest of Redwood City. Nature of repairs: Make earth fill on downstream side; install 30-inch pipe for spillway.

SAN MATEO COUNTY—Emerald Lake No. 2 Dam No. 612-2. Leonard & Holt, San Francisco, California, owner; earthenfill, located 2½ miles west of Redwood City.

MONTEREY COUNTY—Black Rock Dam No. 643. Monterey Game and Stock Association, Monterey, California, owner; earth and rock fill, situated on North Fork of Black Rock Creek tributary to San Clemente Creek in Sec. 32, T. 17 S., R. 2 E., M. D. M. Nature of repairs: Repair drain pipe.

TENNESSEE—Completion of State Highway No. 100 will provide a shorter route between Nashville and Memphis and will tap the largest area in the state lying five miles from an existing trunk highway.

HIGHWAY PATROL APPOINTMENTS

For Month of June

The following officers have been appointed members of the California Highway Patrol in the following counties:

HUMBOLDT COUNTY—Thaddeus J. Donarin; Albert A. Nickols; Harold R. Down.

MONTEREY COUNTY—A. W. Martin, Jr.; Whitmer R. McGregor; Chas. E. Garcia.

SHASTA COUNTY—Raymond Larison; Marion P. Howard.

BUTTE COUNTY—Wm. J. Bathurst, Jr.

SAN LUIS OBISPO COUNTY—Jesse L. Urey; Cecil C. Dempsey.

COLUSA COUNTY—Archie G. Matzka; Jean Schilling Thayer.

EL DORADO COUNTY—R. P. Cornelison, Thomas V. Eisenhuth.

SAN JOAQUIN COUNTY—Merrill K. Harper.

ARCHITECTURAL AWARDS

For Month of June

PRESTON SCHOOL OF INDUSTRY, Ione: Contract for installation of refrigerating system, Refectory Building, awarded to Parker Ice Machine Company of San Francisco, \$7,992.

BORDER STATION at Fort Yuma: Contract for construction of same for use of Department of Agriculture and Division of Motor Vehicles awarded to Holland Construction Company of San Diego, \$18,734.

FOLSOM STATE PRISON: Contract for installation of passenger elevator in new Hospital Building awarded to Spencer Elevator Company of San Francisco, \$3,095.

CALIFORNIA SCHOOL FOR DEAF, Berkeley: Contract for wrecking Strauss Hall awarded to Symon Brothers of Oakland, \$2,500.

VETERANS HOME, Yountville: Contract for construction Guard House awarded to Gaubert Brothers of Oakland, \$15,750.

STOCKTON STATE HOSPITAL: Contract for construction of Crematory Furnace awarded to JNJ Firebrick Construction Company of San Francisco for \$1,888.

Against total exports of 835,527 motor vehicles from the United States and Canada there were but 750 motor vehicles imported into the United States during 1929.

FOILED THE COPS

"Coming home the other night at three o'clock our headlights burned out on us."

"How did you get home without getting arrested?"

"We just drove at full speed and all the cops thought we were bootleggers."

SALVAGING WATER WASTE IN

LOS ANGELES COASTAL BASIN

(Continued from page 16.)

16. Investigation of locations for best utilization of water imported by Metropolitan Water District.

17. Study of organization for financing and distributing benefits.

18. Study of legal phases.

It will be seen that the work which is being done or which may be done toward salvage resolves itself into two general phases.

In one, actual construction is the main feature and the result will be immediate salvage of waste. In the other, research for a term of years is necessary to arrive at the more elusive wastes and the best methods of utilizing all wastes and imported waters.

OTHER PHASES OF INVESTIGATION

The various other phases of the water study of California are continuing.

DAM APPROVALS AND PERMITS

To date 673 applications have been filed with the Department for approval of existing dams and dams under construction.

OTHER ACTIVITIES DURING MONTH

There were the usual activities during the month in connection with flood control and reclamation, bank protection, adjudication of water rights, compilation of data secured by snow surveys, irrigation district matters, etc.

IRRIGATION AND RECLAMATION FINANCING

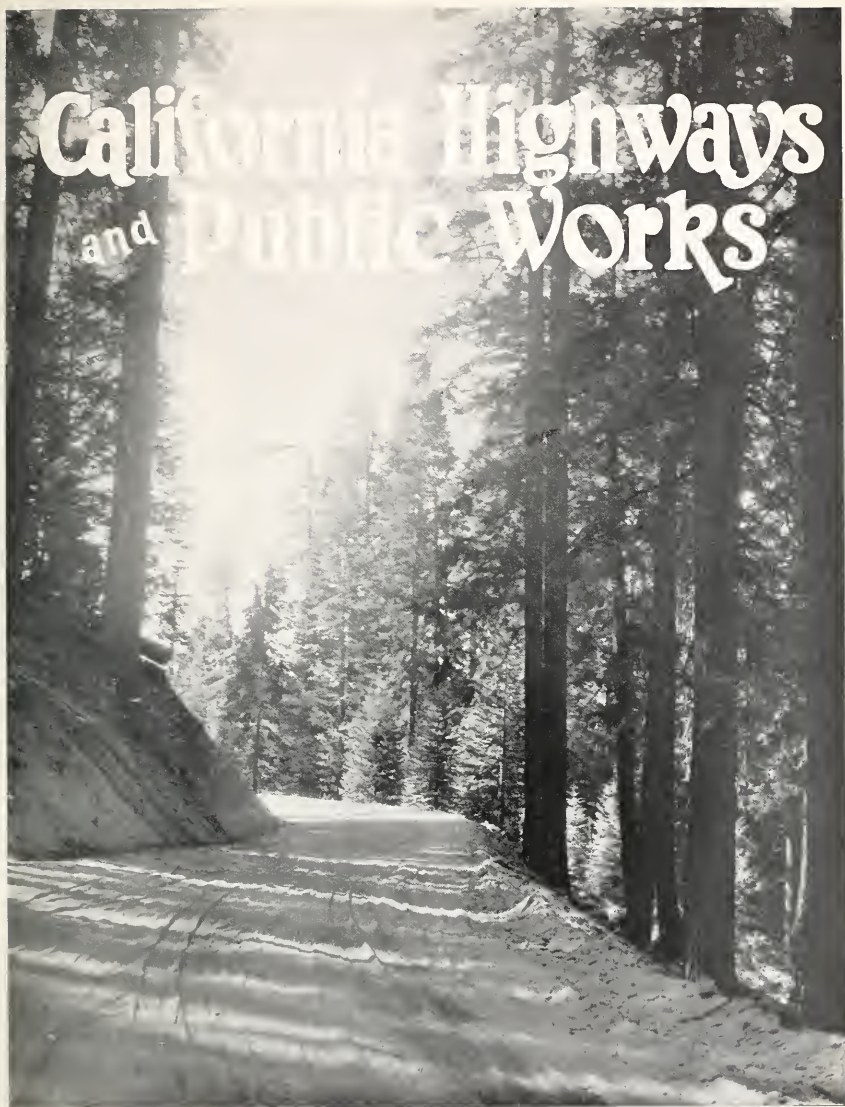
A meeting of the California Irrigation and Reclamation Financing and Refinancing Commission was held in the offices of the Attorney General at Sacramento on July 18th at 10 a.m. The following members of the commission were in attendance: Will C. Wood, Superintendent of Banks, chairman; Edward Hyatt, State Engineer, secretary; Charles L. Childers, attorney, Imperial Irrigation District, El Centro; Fred W. Kiesel, president California National Bank, Sacramento; Charles E. MacLean, vice president Anglo and London-Paris National Bank, San Francisco; U. S. Webb, Attorney General.

This meeting was called particularly for the purpose of hearing from those actively interested in reclamation districts and to consider the financial problems of these districts, especially those in the Sacramento Valley. The next meeting of the commission will be held in Stockton on Thursday, August 28th, at 10 a.m.

The red light is the place where you catch up with the driver who passed you at fifty miles an hour eight or nine blocks down the line.—Detroit News.

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.






ON THE KINGS RIVER HIGHWAY

Official Journal of the Department of Public Works
SEPTEMBER State of California 1930



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Mid-summer Traffic Census on State Highways Shows Normal Increase

By T. H. DENNIS, Maintenance Engineer

THE semiannual traffic count of the Division of Highways was taken July 13th and 14th between the hours of 6 a.m. and 10 p.m. each day throughout the state highway system. For purposes of analysis, the vehicles are segregated by hourly periods under the following classifications: California automobiles, foreign automobiles, light trucks, heavy trucks, trailers, buses and horse-drawn vehicles.

A comparison of the July, 1930, count with that of July, 1929, shows the following increases:

	For Sunday per cent	For Monday per cent
Main north and south routes.....	7.3	12.6
Laterals between inland and coast routes.....	6.4	8.1
Interstate connections.....	13.8	17.0
Recreational routes.....	5.0	8.5
Average all routes.....	7.3	11.6

The gain or loss on a particular route expressed in percentage may show a considerable variation from the record of the previous year. This is especially noticeable on some of the shorter routes and may be accounted for, in the main, by the fact that construction operations may have interfered with normal traffic either last year or during the recent count. Other local influences such as local celebrations, etc., may cause a marked difference if the count happens to come at that time.

Gain or loss in traffic volume expressed as a percentage of the July, 1929, count for all state highway routes, is as follows:

Rt. No.	Description	Sunday		Monday	
		gain	loss	gain	loss
		per cent	per cent	per cent	per cent
1	Sausalito-Oregon Line.....	8.3		8.9	
2	San Francisco-San Diego.....	4.4		1.3	
3	Sacramento-Oregon Line.....	34.2		45.5	
4	Sacramento-Los Angeles.....	8.2		17.0	
5	Stockton-Santa Cruz.....	16.3		7.6	
6	Sacramento-Woodland Jct.....	23.2		21.3	
7	Tehama Jct.-Benicia.....	16.8		16.1	
8	Ignacia-Cordelia.....	46.3		51.3	
9	San Fernando-San Bernardino.....		3.2	13.1	
10	San Lucas-Sequoia National Park		9.1	1.8	
11	Sacramento-State Line via Placer-				
	ville.....	28.6		29.4	
12	San Diego-El Centro.....	11.5		11.9	
13	Salida-Sonora.....	2.4		9.2	
14	Albany-Martinez.....	5.0		11.0	
15	Rt. 1 near Capella-Emigrant Gap.....	14.1		13.3	
16	Hopland-Lakeport.....	2.4		6.8	
17	Roseville-Nevada City.....	5.9			1.6
18	Merced-El Portal.....		6.5	4.2	
19	Rt. 9 west of Claremont-Riverside.....	2.7		6.6	
20	Redding to Rt. 1 near Arcata.....	18.5			8.2
21	Rt. 3 near Richvale-Quincy.....	16.5		21.2	
22	San Juan Bautista-Rt. 32.....	10.7		14.9	
23	Saugus to Jct. Rt. 11.....		6.5	1.6	

Rt. No.	Description	Sunday		Monday	
		gain	loss	gain	loss
		per cent	per cent	per cent	per cent
24	Rt. 4 near Lodi to Junction Rt. 23	12.9		12.7	
25	Nevada City-Downieville.....	9.4		54.1	
26	San Bernardino-El Centro.....	0.9		11.7	
27	El Centro-Yuma.....	11.6		7.7	
28	Redding-Nevada Line.....		16.2	3.0	
29	Red Bluff-Nevada Line.....		7.4	6.2	
31	San Bernardino-Ivanhoe.....	4.6			4.4
32	Rt. 4 near Califa-Rt. 2 at Gilroy.....	0.8		16.0	
33	Rt. 4 near Lakersfield-Paso Robles.....		4.5		11.0
34	Rt. 4 near Arroyo-Picketts Jct. via				
	Jackson.....	8.4		16.7	
35	Pearmt-Kuntz.....		63.6		26.3
37	Auburn-Truckee.....		7.2	5.5	
38	Meyers-Nevada Line via Truckee.....		67.0		50.9
39	Tahoe City-Nevada Line.....	53.7		115.4	
40	Rt. 13 near Montezuma Rt. 23				
	Monro Lake.....		96.1	5.8	
41	West and East of Hume.....		13.1		15.6
42	Saratoga Gap-Redwood Park Gate.....	114.7		84.6	
43	San Bernardino-Big Bear Lake.....	16.5		18.1	
44	Boulder Creek-Redwood Park.....	19.9		5.3	
45	Willows-Rt. 3 near Biggs.....	6.9		3.8	
46	St. 1 near Klamath River-Rt. 3				
	near Clay.....	15.0		27.0	
47	Orland-Chico.....		16.9		0.7
48	McDonald-Woodbine.....		27.9		17.5
49	Calistoga-Lower Lake.....	25.2		24.8	
51	Santa Rosa-Shellville.....	5.2			21.6
52	Alto-Thibron.....		20.1		18.0
53	Fairfield-Lodi.....	27.2		35.6	
54	Near Michigan Bar-Central Hou e.....		4.3	37.8	
55	San Francisco-Saratoga Gap.....	12.7		23.5	
56	Carmel-Cambria.....	12.3		5.7	
57	Santa Maria-Freeman.....	32.1		19.1	
58	Mojave-Topock.....		15.2		24.5
59	Leicester-Balleys.....	29.5		38.3	
60	El Rio-Serra.....		4.9	26.1	
61	La Canada-Mt. Wilson Rd.....	27.7		43.4	
63	Big Pine-Oasis.....	47.8		57.1	
64	Mecca-Blythe.....	8.7			44.7
65	Auburn-Sonora.....		9.3	19.9	
66	Manteca-Mossdale.....		8.9	13.3	
67	Palmar R.-Jct. Rt. 2.....	4.4		5.9	
68	San Francisco-San Jose.....	66.1		82.9	
69	San Rafael-San Quentin.....		0.6	12.2	
70	Ukiah-Men. State Hospital.....		15.2	7.3	
71	Crescent City-Oregon Line.....		10.6		9.9

A comparison of traffic census for July 1929 and 1930 in the count from 6 a.m. to 10 p.m. show the following figures:

Route 1. Sausalito to Oregon Line						
Station location	July, 1929		July, 1930		Mon.	
	Sum.	Mon.	Suo.	Mon.		
Sausalito to Ferry Bldg.....	495	267	179	134		
Sausalito, Hyde St. Ferry.....	11,154	4,111	11,930	4,761		
Belvedere Jc. R. 52 to Belvedere,						
S. on 1.....	14,516	6,407	17,691	6,610		
E. on 52.....	2,935	1,109	1,694	940		
N. on 1.....	13,749	5,870	17,869	6,666		
San Rafael N. of Cy. at top hill	12,253	4,653	12,437	5,825		
Petaluma S. Cy. Lts. at Maint.						
Yd.....	9,053	3,978	9,372	4,963		
Petaluma N. of Cy.....	10,579	5,572	10,446	6,644		
Castai at Jct. C.R. to Sebastopol,						
S. on 1.....	9,839	4,133	8,710	4,402		
W. on C.R.....	5,508	1,833	4,632	1,663		
N. on 1.....	4,499	2,684	4,265	3,027		
Santa Rosa S. of Cy. at Triangle						
Service Sta.....	3,675	4,531	4,718	3,400		
Santa Rosa N. of Cy. at S. P.						
R. R. Xing.....	6,330	4,573	6,791	5,112		
Healdsburg S. of Cy. at N W.						
P. R. R. Xing.....	4,526	3,146	4,577	3,531		
McCrays Jct. C.R. to Preston,						
S. on 1.....	2,608	1,872	2,329	1,779		

(Continued on page 28.)

The California Institution for Women

By GEO. B. McDOUGALL, State Architect

AT THE present time in this state about 120 women felons, vagrants, and misdemeanants are detained in what is known as the Women's Building at the State Prison at San Quentin, in Marin County, and are under the same management and control as the more than 4000 male prisoners incarcerated there.



GEO. B. McDOUGALL.

These 120 women occupy the entire capacity of the Women's Building and the number of women is increasing. There is practically no opportunity whatever at San Quentin for outdoor work of any kind.

Responsive to the vision of Governor Young and to his recognition of the fact that

women law violators should be detained under different conditions and entirely separate from male prisoners, the legislature of 1927 passed an act creating a commission of five members, the majority to be women, to investigate and report its findings to the Governor prior to the meeting of the 1929 legislature. This commission recommended that a separate institution for women be established on a site to be selected and suggested a method of management and control.

The legislature of 1929, with the approval of the Governor, accepted the commission's recommendation and passed an act creating a separate institution for women to be under the management and control of a board of trustees of five members, three to be women, and also appropriated \$475,000 to purchase a site and start construction of necessary buildings.

Soon after this act became effective, Governor Young appointed the following trustees: Mrs. Ernest Wallace of Alhambra, chairman; Mrs. Everett B. Latham of Los Angeles, Mrs. Ingram B. Sloeum of San Francisco, Mr. Fred D. Parr of San Francisco, and Mr. J. Frank Burke of Santa Ana. This board and chairman constitute the Division of Women's Prisons, which is one of the divisions of the State Department of Penology over which Mr. James A. Johnston presides as director. Mrs. Wallace as chairman of the board of trustees is chief of the division.

After examination of numerous suggested sites in various parts of the state, a piece of land in Cummings Valley in the southern part of Kern County, nine miles from Tehachapi, and containing 1682 acres, has been selected by the trustees and acquired by the state as the site for the new institution. Before its final selection this site was carefully examined as to the location, transportation facilities, climate, character of soil, the water supply, available building areas, and farming possibilities, and was found to be satisfactory. It may properly be said to be one of the best sites which the state has considered in the light of requirements of the California Institution for Women. The location is isolated both geographically and in relation to the main highway giving access to it, and for such an institution this isolation is especially desirable. Transportation will be by the Southern Pacific Railroad to Tehachapi and by automobile travel over excellent highways from Bakersfield and to Los Angeles. The elevation above sea level is about 4000 feet, and the climate is not excessively warm in the summer nor very cold in the winter. When the main highway from Los Angeles to the San Joaquin Valley, known as the Ridge Route, has been closed in the winter on account of snow, this highway between Bakersfield and Los Angeles by way of Tehachapi and Mint Canyon has been used as a detour.

The major portion of this site is comparatively level and available for use either as building site or for farming and truck gardening. The soil is rich and capable of producing a large variety of products.

There are several water wells on the property and an adequate supply of water of fine quality can be developed from additional wells



Airplane view of site near Tehachapi for California Institution for Women.

as required for both domestic use and irrigation.

As soon as the site was selected, and in keeping with Governor Young's forward-looking program of building construction for all the state's institutions, the Division of Architecture at the request of the board of trustees put a party of surveyors into the field to determine the contours of the ground, and started the study of a tentative plot plan to show the suggested development of the entire site for an ultimate institution to accommodate about 500 inmates and about 100 employees.

This plot plan, also preliminary sketches for particular buildings, have already had consideration by the board of trustees. When finally approved this plot plan will constitute a basis for determining upon a tentative 10-year building construction program beginning with the current biennium.

Work has already started on the repair and alteration of the old farm house on the property to make it available for a temporary office of the institution during building construction and for quarters of a man and his wife who will act as caretakers, and for accommodation for the members of the board of

trustees and for the state officials having business at the site. Working drawings and specifications as required for taking bids on the permanent structures to be built with the 1929 appropriation should be ready so that permanent construction work can start at the site by the end of the present year, 1930. This will permit of the occupancy of the institution by the women now detained at San Quentin sometime during the latter half of the year 1931, thus releasing the present Women's Building at the State Prison at San Quentin for use as a hospital for that institution.

The particular site on the property to be used for the main group of buildings is in the shape of a basin, surrounded almost entirely by a range of hills, and the buildings so located will be seen to excellent advantage and will be effectively protected from prevailing winds. While there will be a unit for detaining inmates who may not yet have learned the wisdom of maintaining good behavior, the majority of the inmates will be housed in cottages having a capacity of about 50 each. These cottages will be self-contained homes, each having its own living room, dining room, and kitchen. Small separate sleeping rooms

will be provided for most of the inmates, together with small dormitory sleeping porches with small private dressing cubicles. Two employees, a matron, and one assistant will be housed in each cottage in order to insure complete control and safety in management. Thus, these cottages will each be a home for those living in it and as far as possible in a building housing a family of 50 will have the qualities required to promote home life. The architecture of these cottages both outside and inside, also the landscaping about them, will be in keeping with this idea.

In addition to the detention unit and cottages, there will be a receiving and hospital building and administration building, an education building, possibly a chapel, an open air assembly building, industrial buildings, garages, warehouse, commissary and laundry buildings, and a group of farm buildings.

This new women's prison, so called, is not intended as a punitive institution but a corrective one "to provide custody, care, protection, industrial, vocational, and other training and reformatory help for women confined therein." The purpose is to rehabilitate women convicted of felonies, female vagrants, and narcotic misdemeanants.

There will be plenty of outdoor work which will tend to maintain good health in the inmates and the board of trustees is authorized in its discretion to compensate them, any accumulations resulting to be held for the benefits of the particular inmate or forwarded to her dependents as the board may decide.

It is the intention of the board of trustees that the institution shall be an asset to the community surrounding it.

The superintendent is to be a woman and all other employees, as far as practicable, are to be women.

THE FIRST AUTOMOBILE

Who had the first automobile in the world?

The first automobile which actually ran, which incidentally was steam propelled, was built in France between 1760 and 1770 by Captain Nicholas Joseph Cugnot, history declares.

The first gasoline-operated automobile in America was Charles Duryea's "Buggyaut" which came out in 1892. Henry Ford's first car followed in 1893, and in 1894 Elwood Haynes' historic automobile was brought before the public eye.

In 1892, history states, an electric automobile built by William Morris of Des Moines, Iowa, was sold to a Chicago citizen.

Highway building under the spur of modern transportation and rapid development of both urban and rural localities, is a never-ending task. And as a result as well as a cause, California is an ever-growing state.—*Corcoran Journal*.

Traffic Officers Have Perilous Job

THE hazardous character of the California traffic officer's job is evidenced in a report by Eugene W. Biscailuz, superintendent of the California Highway Patrol, showing three officers killed and sixty-nine injured in performance of their duty within the last eighteen months.

Two of the fatalities occurred in the Kern County squad, Officers Howard C. Garlinger and L. W. Hogan dying in highway crashes. The third was Officer Leland Bond of San Mateo County.

The sixty-nine counted as injured include only those who were off duty long enough to draw compensation and does not include scores of sprained legs, battered hands, lacerated faces, etc., which traffic officers come to regard as a part of the daily grand of watching the roads.

Biscailuz said many of the injuries are of an extremely serious nature, one officer having been off duty for eighteen months. Broken legs and arms, incurred in dashes after speed-maddened motorists, are of frequent occurrence.

The average number of men killed annually is three while the number killed or seriously hurt annually over a period of years has been close to 25 per cent of the entire personnel of the patrol.

Traffic officers find it difficult to secure life insurance except at exorbitant rates because of the extremely high hazard involved. Through an arrangement worked out with the State Compensation Insurance Fund, however, injured officers received \$25 a week after the first week while off duty and the families of officers killed on duty receive a like amount until the sum of \$5,000 has been paid.

In addition, the officers have protected themselves to a degree by benefit funds set up by their own associations.

In the hope of minimizing the death toll in the patrol, orders have been given that motorcycles be discarded for automobiles by men operating on night patrols or in wet weather.

In the modern household practically everything is operated by switches except the children.—*Arkansas Gazette*.

Doctor (after bringing victim to)—How did you happen to take that poison? Didn't you read the sign on the bottle? It said "Poison."

Ebenezer—Yassah, but Ah didn't believe it.

Doctor—Why not?

Ebenezer—'Cause right underneath it was a sign dat said, "Lye."—*The Pathfinder*.

Report on Five Seasons' Study of Sacramento-San Joaquin Water Area

By HARLOWE M. STAFFORD, Sacramento-San Joaquin Water Supervisor

BULLETIN No. 23 of the Division of Water Resources comprising the Sacramento-San Joaquin Water Supervisor reports for the five-year period 1924 to 1928, inclusive, has recently been published by the State Engineer and will soon be released for distribution.



HARLOWE M. STAFFORD.

The publication of this bulletin marks the completion of five seasons' work under the Water Supervisor Plan in the Sacramento-San Joaquin territory. This work had its inception in the unusually short water year of 1924. Its immediate status was that of an emergency measure effected by the water users themselves to tide

over the critical situation of that year. However there was an underlying and more fundamental conception that, by its inauguration, a definite and necessary step was being taken toward the ultimate solution of the water difficulties in the territory involved. Of first importance in that solution comes conservation, both by careful use of existing natural flow and by storage of flood flows. But to attain effective conservation there must be an authoritative, orderly and equitable distribution of the water supply to those entitled to receive it. Such distribution requires as a basis either an adjudication of water rights or a mutual agreement and stipulation, either temporary or permanent, among the water users. In working out an adjudication or mutual agreement there are certain facts and data which are indispensable, namely, the records of the diversions and uses of water, and the pertinent hydrographic data on stream flow, return flow, duty of water, etc.

In the Sacramento-San Joaquin area there has been no adjudication of rights and due

to the complicated nature of the situation it would appear that the ultimate distribution of water may be most satisfactorily based upon mutual stipulation, perhaps temporary at first but ripening to permanent adjustment and agreement, similar to the outstanding example on Kings River.

In preparing the way for this solution, then, the value of the work commenced in 1924 and continued to date is evident. Through the office of the Water Supervisor of the Division of Water Resources, all diversions of water have been measured, the stream flow and return flow have been recorded and duty of water and salinity investigations pursued. The results of this work have been reported annually in mimeograph form but for purposes of preservation and wider distribution, as well as to afford an opportunity for review, comparisons, summarizations, and such analyses as may be made, it is felt they should be brought together in a printed publication, and that is the purpose of this bulletin.

WASTE AVOIDED

In addition to the engineering investigation, collection of records, etc., the office of Water Supervisor has been of service in effecting conservation and waste prevention measures in the seasons of low flow. In respect to this and to actual stream administration the water supply of two seasons, 1924 and 1926, has been such as to urgently require the efforts that have been made and in the seasons of 1925, 1927 and 1928, the urgency has not been so great. As the work in each season has progressed, however, the water users, both upstream and in the delta, have become better acquainted with the methods adopted and in doing so have more readily extended their cooperation. A practical demonstration has been made that with each water user doing his reasonable share or perhaps making some sacrifice, situations which otherwise might prove critical, may be successfully relieved, thereby effecting the maximum benefit to the greater portion of the territory involved. With a more intimate knowledge of the Water Supervisor procedure on the part of the water users, and with the addition to the record each year of the valuable facts as to

the use of water, stream flow, etc., the Division of Water Resources through the Water Supervisor becomes more and more prepared and ready to initiate (upon short notice in case of water shortage) some schedule or plan to be mutually agreed upon by the water users, for the most equitable and efficient administration of the water.

HISTORY OF WORK

The water situation on the Sacramento and lower San Joaquin rivers and in the Sacramento-San Joaquin delta is one that has become well known throughout the state, and published Bulletins No. 3 and No. 4 of the former Division of Water Rights have described in detail the particular conditions and events in 1924 which lead to the inception of the Sacramento-San Joaquin Water Supervisor work in that year. Bulletin No. 3 is a record of the proceedings of the first Sacramento-San Joaquin River Problems Conference held in January, 1924, and Bulletin No. 4 reports the transactions and papers of the second conference which met in December, 1924, and presents the Water Supervisor's report for the 1924 season. The first conference resulted in the appointment of a committee known as "The Permanent Committee of the Sacramento-San Joaquin River Problems Conference," and through the efforts of this committee working with the Division of Water Rights, the office of Water Supervisor was established by that division, "to bring about the greatest possible conservation of water and to commence the collection of the records of use of water, stream flow and other engineering data necessary in the ultimate attainment of a solution to the water problems." The necessary funds for the conduct of the work in 1924 were raised, through the efforts of the permanent committee, almost entirely by voluntary local subscription. Since 1924, however, the work has been carried on under state appropriation.

THE SITUATION

In the Sacramento-San Joaquin territory from Redding at the upper and of the valley on the north to Vernalis and lower San Joaquin River points on the south the present water requirements may be grouped as follows:

(1) Irrigation.—Above the city of Sacramento, for approximately 90,000 acres of rice and 140,000 acres of general crops on the Sacramento River itself and 50,000 acres of rice and 45,000 acres of general crops on its tributaries. Below Sacramento, in the 425,000-acre delta region, for an area of nearly

300,000 acres of general crops irrigated annually, and on the uplands bordering the delta for about 65,000 acres of general crops.

(2) Navigation.—Requires sufficient flow in the Sacramento River for 125 miles above Sacramento to permit the passage of freight steamers. The federal government has stated that a flow of about 3500 second-feet is needed to properly care for this requirement.

(3) Salinity Control.—Requires a flow to the delta sufficient to protect that area from the encroachment of salt water from San Francisco Bay. A bulletin is shortly to be published covering the salinity investigations to date and more particularly the intensive investigation of 1929-30. This will show the exact flow requirements to accomplish salinity control in the delta, but a tentative figure of probably not less than 4000 second-feet for the combined flow to the delta of the Sacramento and San Joaquin rivers is indicated.

With an almost unbroken succession of years of subnormal stream flow since 1916, the full satisfaction of these water requirements has been impossible and in 1920, 1924 and 1926, but particularly in 1924, the situation was acute. This is brought out more vividly by a comparison of the river flow at Red Bluff and the irrigation draft. For example, in 1926, the average discharge of the Sacramento River at Red Bluff, July to September, inclusive, was 3140 second-feet, and in the same period the average irrigation draft, Redding to Sacramento, was 3210 second-feet. In the month of July, 1926, the Red Bluff flow was 3190 second-feet and the irrigation draft was 4220 second-feet, segregated to 1208 second-feet under old appropriative rights (initiated prior to the Water Commission Act, 1914), 2690 second-feet appropriative rights under the Water Commission Act, and 322 second-feet presumably riparian or unknown old appropriative rights. Compare, in turn, these data with the facts that ultimate use, Sacramento to Redding, of appropriative rights under permits already granted by the Division of Water Resources, will probably amount to 4000 second-feet and that there is a total maximum use to date of 2000 second-feet under old appropriative and riparian claims on the same stretch of river.

ALLEVIATING FACTORS

Fortunately, for the present, use through appropriative rights initiated under the Water Commission Act has not reached full development, and, due to rotation and idle lands, full use under all riparian and old appropriative rights does not occur simultaneously. Another and most important

Slurry Base Construction on Desert Roads

By C. S. POPE, M. Am. Soc. C. E., Construction Engineer, Division of Highways

IN THE construction of crusher run bases on desert road construction, the problem of the economical use of water in binding such bases has led to a type of construction on the California highways which we have designated as the slurry base construction.

Essentially, this method consists of plant production of a concrete or slurry composed of crushed rock graded from 2½-inch to dust and containing about 15 per cent of material passing the 200 mesh which has a cementing value. The method of production is as follows:

Material for the base is obtained usually from pits or talus slopes and is crushed to the proper size in a crushing plant of ample capacity. If necessary, fine material is added to bring the 200-mesh material up to the requirements of the specifications. In order to secure accurate composition of the mixture, the material is often screened and remixed by a belt system and then passed to a mixer either of the pug mill type or revolving drum. The mixer shown in the illustrations is the revolving drum type. The aggregate and dust are weighed out with some care or are proportioned by volume, and the water is added in an amount of about 9 gallons per ton of aggregate. It is then mixed for a period of 30 seconds and when dumped has a consistency of damp concrete. The distribution of aggregate is complete and uniform and when the material is hauled to the road, it may be spread without segregation. Spreading is done by means of one-man graders or by the use of a caterpillar and blade, depending



Mixing slurry base in drum mixer.

upon the quantity to be handled. After the material has been bladed to a smooth surface, it is drenched with water to the extent of about 3½ gallons per square yard and rolled with a 10-ton roller. The appearance of the base with fine cementing slush brought out by the roller suggested the term slurry base. The resulting base is allowed to bake hard, and if the materials are properly selected, the result is an astonishingly firm foundation. The base is kept sufficiently damp to protect it from raveling and is usually covered within 24 hours by an oil-mixed surfacing from 3 to 4 inches in compacted thickness.

The method has shown a great saving in the amount of water to be used and gives a base which is far better than could be obtained by simply spreading the mixed aggregate and sprinkling and rolling in the usual way. Such bases are obtained at a cost of about \$1.80 per ton and in favorable locations, no doubt, this cost could be decreased.

The success of the method has been so pronounced that it is being used on a considerable mileage of desert roads at the present time.



Rolling slurry base with macadam roller.

Conkling Author With Baker of Book On Water and Uses

HAROLD CONKLING, deputy in charge of water rights, of the Division of Water Resources, Department of Public Works, is joint author of a new book, "Water Supply and Utilization." Associated with him in the authorship is Donald M. Baker, consulting engineer.

The new volume is described by John Wiley and Sons, Inc., of New York publishers, as "An outline of hydrology from the viewpoint of the arid section of the United States together with an outline of water law and its administration



HAROLD CONKLING.

as it has been developed in the arid states," and continuing the announcement says:

"This book may be considered as a handbook on water supply. While the material is of universal application it has a western background. It contains a broad outline, a mass of specialized information on hydrology, water development and water law in the western states. It is the only text treating the subject from the arid region standpoint. It contains, also, a thorough consideration of water law as it has been evolved and developed to suit peculiar conditions in the west.

"The book will serve not only as a text for students but will be of great value to engineers, attorneys, bankers and public officials in the western states who are interested in water development and wish to enlarge their knowledge of its principles and practice. It will interest also similar groups everywhere who are interested in water supply and its comprehensive utilization."

The book contains:

Introduction

The Long History of the Use of Water

Climatology

Precipitation

Measurement of Precipitation

Disposition of Precipitation

Evaporation

Evaporation of Moisture from Soils

Transpiration

Streamflow and Runoff

Flood Flows

Methods of Forecasting Streamflow

Water Rights in Surface Streams

Riparian Rights

Doctrine of Appropriation

Miscellaneous

State Water Codes

Statutory Provisions

Determination of Available Water Supply

Supply from Normal Flow

Available Supply from Storage

Groundwater Hydrology

General Principles of Occurrence of Groundwater

Occurrence of Groundwater in Rocks

Influence of Rock Structures upon Groundwater Springs

Groundwater in Alluvial Deposits

Movement of Underground Waters

Yield of Groundwater

Water Rights in Underground Water

Purposes for Which Water is Utilized

Use for Irrigation

Domestic and Municipal Supplies

Conflict and Correlation Between Uses of Water

Administration of Streams

Adjudication of Existing Rights

Statutory Provisions Relative to Adjudications

Distribution of Water

Valuation of Water Rights

Methods of Valuation

Quality of Water

Harold Conkling served eleven years with the U. S. Reclamation Bureau on investigation of steam developments throughout practically the entire west, acting as special advisory hydraulic engineer from headquarters office. For six years he was engineer with the Division of Water Rights for the State of California on special investigation of magnitude and as advisor on hydro power and large irrigation projects. Later, for a period of two years, he was Chief of the Division of Water Rights, administering the water law of California. He is now Deputy State Engineer of California.

Donald M. Baker, is a graduate in civil engineering from the University of California. He served three and one-half years with the U. S. Indian Irrigation Service on water development in the southwestern states. For seven years he was hydraulic engineer with the State Water Commission of California. For the past five years he has been a consulting engineer, specializing in water development.

All ye who intend purchasing canines hearken and abide by the following:

For ye bean lovers—Boston.

For ye tobacco chewers—Spitz.

For ye bald heads—Hairless hounds.

For ye interpreters of Hamlet—Great Dane.

For ye lazy persons—Police.

For ye penniless—Mutt.

WASHINGTON, D. C.—Reports received from state highway departments and compiled by the Bureau of Public Roads, indicate that state and local authorities plan to spend \$1,601,167,455 for highway improvements during 1930.

State Highway Patrol Aids Motorists; Services Cover a Most Varied Field

THE WIDE range of activities of the California Highway Patrol are indicated by letters received from the traveling public, telling of work done and assistance given by officers of the Patrol. Excerpts from the following letters will be of interest:

The Civil Service Board of Oakland writes to thank the Department of Public Works for assistance given that board in conducting a practical test for auto truck drivers for employment by the city. Officers C. Ralph, E. J. Dias and A. Lawson of the California Highway Patrol were assigned to help the city in conducting this test. The Civil Service Board writes as follows: "There were seventy-three candidates who took the test, which was a very comprehensive and practical one. Your officers made the rating on each man and the test was completed in two hours time. The snappy and efficient manner in which these officers performed the duties assigned to them speaks very highly for your organization."

AIDS IN ACCIDENT

F. F. Smith & Company, Inc., of Sacramento writes that one of its cars was in a collision near Antioch. The driver of its car was injured and the driver of the other car killed. The letter continues: "This is the first experience we have had with the Highway Patrol, and we wish to take this opportunity of expressing our appreciation of the splendid service rendered and the courtesy extended to our man. The officers who had charge at the site of the accident were Inspector Brown, Officer Sloat and Officer Dewarn, and another officer whose name we did not procure. We wish you would extend our sincere thanks and appreciation for the assistance they rendered."

COURTEOUS CORRECTION

Edwin T. Blake of San Francisco writes as follows:

"On Saturday, at 11:20 a.m. about two miles north of Sausalito I was stopped by one of the traffic officers for cutting in too quickly after passing a truck. I was wholly unaware that I had done anything that would endanger my life or that of anyone else, but I defer wholly to the judgment of the traffic officer

whose view of the occurrence from the side lines was much better than mine from the driver's seat.

"I wish to most highly commend the traffic officer for his courtesy and consideration and the care with which he explained the dangers in passing other vehicles on that rather narrow and crooked highway. Unfortunately I did not make a note of the officer's number.

"I have been driving a car for 28 years during which time I have covered some half million miles and this is the first time that I have been called upon to show my driver's license or had my number taken.

"I hope that I can keep my name from invading your department records for another half million miles."

AIDED IN FIRE FIGHTING

Edwin F. Smith, Forest Supervisor of Placerville, writes to express appreciation for the cooperation given his organization in the suppression of a forest fire in his district.

WHEN HELP WAS NEEDED

Gertrude Cugin of Santa Barbara writes as follows: "A woman friend and myself were in sore need of masculine strength for a change in tires, owing to a bad puncture near the Cabrillo Pavilion. Your two officers in a car bearing license No. E-5808 and one of them with a Captain's badge with No. 51 on it, gave us most efficient and courteous assistance. Such men make one proud of our State Highway Patrol service."

FELON ARRESTED

John H. Thieler writes from Chester, Plumas County telling of assistance given in capturing a man wanted for an attempted murder. His letter follows:

"I wish to call your attention to an exceptional service rendered by one of the men of your department. About 12 o'clock midnight on Saturday, I appealed to Officer Tom Birmingham for help in apprehending a man, who had attempted to commit murder, giving the officer a description of the automobile owned by the suspected felon.

"Birmingham immediately communicated with the sheriff of Plumas County reporting the details of the attempted felony, and after patrolling the vicinity continuously through the night he arrested Hatton Bruce, an itinerant lumber worker. While en route to Quincy on Sunday morning to turn Bruce over to Sheriff Braden, the man escaped from custody. All passing cars on the highway were stopped by the officer and instructions given not to pick up any man on foot. After a search of nine hours Bruce was retaken and lodged in the county jail at Quincy, charged with attempted murder.

"Because of these facts, I wish to compliment your department for making efficient police service possible, in isolated mountain towns; and further to commend to you personally, Officer Tom Birmingham of your department, who worked through without relief from the time the crime was reported to him, until 2 a.m. of the following morning."

CROWDS CARED FOR

The Sierra Valley Smith Club writes to thank the Department for assistance given by Inspector White, Captain Blake and Officer Fonta at the annual Swiss celebration at Loyalton, Sierra County, on August 19th. The letter states that the large crowd attending the celebration was handled in a manner most satisfactory both to the officials in charge of the celebration and to the public.

ASSISTANCE TO WOUNDED

W. J. Giffillan of San Francisco writes as follows:

"My wife was seriously cut, in a crash, on the causeway, near Sacramento, on July 26th. Traffic Captain H. R. Jacobs rendered valuable service in obtaining my wife's transportation to the hospital and in helping secure for my sister-in-law, Mrs. Brackman, the information which she would require.

"Traffic Officer W. D. Cassleman cleared the way and escorted the machine carrying my wife to Sacramento."

AUTOMOBILE SAVED

Larry Gott of San Jose writes that Captain R. S. Ryder and Officer White of Ukiah observed his automobile on fire, before he had noticed the fact, and extinguished it with their pyrenes before it had done any great damage.

ARMY ASSISTED

Lt. Col. H. H. Morehead, 251st Coast Artillery, Fort MacArthur, San Pedro, writes as follows:

"The undersigned desires to express the appreciation of the officers and men of the regiment to you for the courtesy extended by allowing your traffic officers to assist the movement of our truck column to the Field Training Camp at Fort MacArthur on August 2, 1930.

"The officers, Geo. Stimson, No. 180, and Lloyd Grooner, No. 175, were courteous, efficient, and a credit to your department.

"The Santa Ana Office, Orange County, is to be commended for the manner in which the affair was handled."

GAS THIEVES CAUGHT

W. H. Hollingsworth of Ignacio tells of assistance given by the Patrol in capturing gas thieves. He writes:

"Through your office I wish to thank our Marin County night patrol, officers Monteverde and Carbine, for the efficient manner in which they caught the three young men who broke into our gas pumps and stole gas.

"Without the aid of the night patrol, the thieves would never have been caught, and you are to be

congratulated upon having two such officers as Monteverde and Carbine."

BEREAVED PARENTS FOUND

Mr. and Mrs. George Danielson of McCloud tell of service given to them by the Siskiyou Patrol at a time when their son was fatally injured on the Klamath lateral. The letter follows:

"We wish you to know of the wonderful aid given us by the Siskiyou County contingent of the State Highway Patrol last Friday, July 4th. Our son, Carl, was fatally injured on the Klamath River Highway and at the time we were traveling in southern Oregon.

"Traffic Officer E. N. Belanger, of McCloud, immediately set about to locate us and called his fellow officers to assist. We were finally located at Klamath Falls. On our arrival at the state line on the Pacific Highway we were met and transferred to an official car and taken with all possible despatch to the Siskiyou General Hospital at Yreka. Your officers rendered this act of human kindness on a holiday when their services were taxed to the utmost.

"We can not adequately express the high esteem in which we hold such outstanding service. We feel that the State of California can well be proud of its efficient Highway Patrol."

INDIO AIDED

L. A. Pawley of Indio, Riverside County, extends thanks to the Department in the following letter:

"Just recently the city of Indio was unfortunately visited by a very serious fire. It might have been much more serious had it not been for the singular service rendered by two of your officers, Mr. George Baker, No. 185, and Mr. Ora E. Townsend, No. 363.

"It therefore gives us pleasure to call to your attention this fact for they are indeed justly entitled to recognition for the exceptional services they rendered at a time when they were seriously needed."

OTHER LETTERS

There are numerous letters from motorists extending thanks to the Department of Public Works for aid given by traffic officers in making repairs to tires and to assisting owners of machines who are having mechanical trouble. There are also many letters from organizations expressing thanks for aid given by members of the Patrol in handling crowds at picnics and parades. A number of letters from persons to whom tags have been given for traffic violations or who were warned of such violations express thanks for the courteous manner in which the officers performed their duties.

No man's world is any bigger than the man himself. That which his eye can see, his ear can hear, his heart can feel, make up for him the universe. For no man has anything he can't use.

What good is money to Hottentot, or a magnificent picture to an idiot?

The whole world for you lies under your own hat, and it is just as large and just as varied as your own mind will let it become.—Salescraft.

New Menace to Highway Develops in Oil Field



Sink near roadside in the Maricopa oil fields

THIS sink occurred in the Santa Maria to Freeman State Highway where it passes into the easterly fringe of the Maricopa Oil Fields. The surface of the highway sagged from 18 inches to 24 inches, where it was crossed by a crack some 60 feet long. The hole in the foreground caved in, as shown, after water, impounded beside the highway, had found a subterranean outlet, at that portion of the crack. Clay washed into this depression. The picture shows the characteristic cracking of this wash clay, due to excessive shrinkage while drying.

Several sinks have been found in this general vicinity, one having entrapped oil, flowing along surface drains. This oil could be seen standing some five feet below the surface. In one instance 1600 barrels of oil was drained out of an oil well sump through the opening of such a crack. Generally the sink is surrounded by successive circles of cracks indicating settlement toward a common center. Various theories are put forward to explain the occurrence of these cracks and sinks, but no definite conclusions have been reached.

Maybe So, Mr. Somner,
But It Sounds Somewhat
Like An Alibi To Us

It is not every man who can appreciate a joke on himself. Mr. F. G. Somner, District Engineer of District Nine, Division of Highways, tells this one.

A family in one of the desert highway camps had a young daughter who was to enter school at Bishop. Mr. Somner offered to take the child to town in his sedan to which the mother gladly consented. Soon above the purr of the motor the clucking and cawing of a hen attracted his attention. Glancing at his young passenger he remarked:

"Was that you? You're quite an imitator!"

The child nodded, smiled demurely, but said nothing.

But the clucking, continuing at intervals, soon ceased to be amusing. Mr. Somner grew somewhat annoyed, then worried, fearing some nervous affliction. The child did not seem ill though rather fidgety under his sharp and anxious glances. So rather than take chances he speeded up to Independence, secured a sleeping draught on the advice of the druggist, and hurried on to home of the child's aunt in Bishop with the parting injunction to call a physician immediately.

With what relief he drove to his residence! But on stopping the car, he suddenly seemed to hear that sound again. What had come over him? Was it all just imagination * * * the heat * * * or was he ill himself? He reached in the rear compartment for his bag. Something in a burlap sack stirred and startled him * * * and clucked much more distinctly. The grateful mother had slipped in a surprise present for Sunday dinner, a fat, frightened but perfectly healthy hen.

NEW AND OLD METHODS IN STATE HIGHWAY BUILDING



- (a) Oil macadam in poor condition, induced by inadequate subsurfacing drainage, chemically and physically adverse subbase (native soil), and volume and unit weight of the pavement was designed far in excess of what the pavement was designed for.
- (b) 12-inches of pit-run gravel blanketing the new adobe embankment and on which is to be placed a modern reinforced P. C. C. pavement, 20 feet wide. New roadbed adequately drained, built 23 feet higher than old roadbed, to safeguard against possible flooding to which old road was occasionally subjected, and on a 100-foot right of way, permitting, thereby, widening of pavement when increased volume of traffic dictates the need.

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDERWAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON AUGUST 28th

C. H. PURCELL, Chief of Division of Highways.

During the past month, contracts have been awarded, work advertised, and plans and specifications commenced as shown in the following table:

Work placed under contract.....	\$2,676,000
Work pending and advertised.....	1,350,000
Total	\$4,026,000

PROJECTS COMPLETED

Work which has been completed and opened to public use during the past period includes the following projects of importance:

NEWHALL ALTERNATE

Of the greatest interest to motorists of southern California is the completion of the "Newhall Alternate," This 8.5 miles of new State Highway in Los Angeles County extends over a new alignment of the Los Angeles to Sacramento artery, south of the Ridge Route, via Weldon Canyon. It connects San Fernando Road, near the city limits of Los Angeles with the Ridge Route at the Santa Clara River, and it diverts the Ridge Route traffic from the old alignment through the Newhall Tunnel, thus relieving the congestion at this point, which has been a great detriment to fast moving traffic. This new construction consists of a graded roadbed 46 feet wide upon which has been placed a Portland cement concrete pavement 30 feet wide. The total cost of constructing this wide stretch of highway amounted to \$271,100.

ARROYO SECO PROJECT

The grading of the first sector of the new "Arroyo Seco Road," which will eventually climb from the canyon to the ridges in the rough country north of Pasadena opening up additional recreational areas, is completed from La Canada to 2.5 miles northerly. This 24-foot roadbed has been cut from the walls of the arroyo, and the use of a large amount of reinforced concrete cribbing was necessary to hold the bank on the steep mountain slopes. The second sector of this project is now under construction carrying the road to 4 miles north of La Canada. Two bridges, one, a large reinforced concrete arch across La Canada Canyon, and the other a concrete girder across Slide Canyon are now under construction. The grading cost of the first sector was \$275,100.

SALINAS RIVER BRIDGE

One of the larger bridges on the Coast Route from Los Angeles to San Francisco has just been completed across the Salinas River at San Ardo in Monterey County. This structure, erected at a cost of \$107,392, is composed of ten 100-foot steel deck truss spans and seventeen 37-foot reinforced concrete girder spans. It replaced the old county bridge, which was

only 15 feet wide, built in 1907 and which was in very poor condition, being dangerous for the traffic and loads which a structure on this important route is called upon to carry.

BAY SHORE HIGHWAY IMPROVEMENT

Grading and placing a bituminous macadam surface has been completed on the most northerly section of the new Bay Shore Highway in San Mateo County. This project extends from the southerly city limits of San Francisco on San Bruno Ave. to Grand Ave. on South San Francisco. The graded roadbed varies from 62.5 feet to 125 feet in width and in crossing the low lying marsh lands the heaviest grading in the State Highway System was encountered, vast amounts of fill being necessary to build up the roadbed. This section of this San Francisco to San Jose highway will eliminate the use of the old crooked and narrow road built many years ago by the county. It connects at the southerly end with section from South San Francisco to Burlingame which is now being paved. The cost of the 3.5 miles from San Francisco to South San Francisco was \$1,435,062.

REDWOOD HIGHWAY OVERHEAD

A 236-foot steel overhead crossing with timber approaches, across the tracks of the Northwestern Pacific Railroad at Forbes Station in Marin County has just been completed. This structure is a unit in the recent relocation of the popular Redwood Highway north of San Rafael. The new alignment eliminates the necessity of using the old crooked road which climbed the hill over the tunnel of the railroad. This new grade separation was constructed at a cost of \$17,300.

PROJECTS ON WHICH BIDS WERE OPENED

Some of the more important bids received during the past four weeks include the following:

SAN DIEGO-EL CENTRO LATERAL

On the San Diego-El Centro lateral, heavy fuel oil is to be applied to the newly graded roadbed on the relocation of this route between La Posta and the Tecate Divide in San Diego County. This work will complete the reconstruction of this important southern California highway to modern standards of width, alignment and grade over the entire distance from San Diego to El Centro. The cost of oiling this 8½ miles will be \$14,000.

ROSE CANYON CUT-OFF

The relocation of main route between Los Angeles and San Diego which lies within the city limits of San Diego, and is referred to as the "Rose Canyon

"Cut-off" will be paved with a Portland cement concrete pavement 30 feet wide. This new routing extends from Balboa avenue to Torrey Pines Road, a distance of 5.4 miles, and will shorten the distance over the existing route, via La Jolla, by 4.5 miles. The grading of this alignment and the construction of a 210-foot reinforced concrete bridge were completed a month ago. The total cost of this relocation will be \$330,000.

COAST BOULEVARD IMPROVEMENT

In Los Angeles and Orange counties three projects will greatly improve the Coast Boulevard from Long Beach to Sunset Beach where they will join the work, now in progress, widening this heavily traveled route as far south as Newport Beach. With the cooperation of the city of Long Beach the road is to be constructed on new alignment from Hathaway avenue to connect with the present boulevard at Seal Beach. The roadbed will be 60 and 100 feet wide over this portion and the Portland cement concrete pavement 40 feet wide. The second project consists of the construction of a 400-foot reinforced concrete girder bridge across the San Gabriel River on this new routing. The third project, from Seal Beach to Sunset Beach, calls for widening the roadbed to the full extent of the right of way and widening the existing 20-foot concrete pavement to 30 feet. This widened roadbed will give much needed parking space to the many motorists who come to the beaches from metropolitan Los Angeles. The total cost of these improvements will be \$467,200.

DESERT HIGHWAYS BETTERMENT

The steady improvement of the desert highways in southern California is noted by the opening of bids for two projects east of San Bernardino. Over 16 miles of the Mecca to Blythe lateral in Riverside County and 9.5 miles of the Los Angeles to Salt Lake Road in San Bernardino County.

Both projects call for the construction of a 36-foot graded roadbed and the placing of an oil treated crushed rock surfacing 20 feet wide, with adequate drainage systems consisting of ditches and dikes constructed parallel to the highway to direct flood waters from desert storms into proper channels, thereby protecting the highway roadbed. The improvement in Riverside County will extend from Desert Center to 9.5 miles west of Hopkins Well and will cost \$280,100. This road has been constructed to modern standards over the 32 miles west of Blythe and the present project will carry this improvement to Desert Center, giving a surfaced road for nearly 50 miles west of Blythe. The improvement of the road in San Bernardino County will extend from Dunn to the Cronise Valley and will cost \$200,700. Of the 193 miles of this route from San Bernardino to the state line, near Jean, Nevada, 108 miles has been graded and surfaced to present day standards of desert road construction and the present improvement will carry these standards easterly to the Cronise Valley, leaving only 75 miles yet to be improved.

CUYAMA LATERAL WORK

Another project will be the improvement of 37.7 miles of the Cuyama lateral in Santa Barbara and San Luis Obispo counties. The work will extend from the second crossing of the Cuyama River to the Kern County line. This work will consist of straightening several curves, smoothing the present choppy gradient and surfacing the entire distance with 20 feet of oil treated crushed gravel or stone. The improvement will cost \$301,500. This road serves as an outlet to the coast for the Maricopa oil fields and

as a connecting link between the San Joaquin Valley and the Coast Route.

COAST ROUTE IMPROVEMENTS

Two improvements worthy of note are to be made on the Coast Route. The one, will be a reinforced concrete girder bridge composed of four 42½-foot spans, which will cost \$21,138. This structure will be built on a new alignment of this heavily traveled route across Nojoqui Creek 7.5 miles south of Zaca in Santa Barbara County. The new bridge will replace the existing narrow structure built many years ago by the county on an alignment which is decidedly dangerous to present high speed traffic. The other is the grading and paving of the three miles immediately north of San Luis Obispo. This improvement will pave with Portland cement concrete and will materially improve the alignment, by eliminating several blind curves, this section of the main artery from Los Angeles to San Francisco. This paving project will cost \$145,400.

MONO COUNTY PROJECT

At a cost of 176,200, 13 miles of the highway through the Walker River Canyon, in Mono County is to be graded to a roadbed width of 24 feet. This improvement will extend from Sonora Junction to Coleville. This road forms a part of the interstate highway connecting Reno, Nevada, with southern California via the Owens Valley. This work is the first of a series of projects to provide an improved highway for this recreational area of the Sierra Nevadas. More and more vacationists are using this route each year, as traffic passing from the Yosemite Valley via Tioga Pass, uses this road.

REDWOOD HIGHWAY

An improvement of special interest to the motorists of the bay area is noted by the opening of bids for the construction of a graded roadbed 36 and 56 feet wide and placing 20 feet of bituminous macadam surfacing from Belvedere Crossing to Tiburon in Marin County. The 4.5 miles from Belvedere Crossing to the Redwood Highway at Alto has been improved and is in very good condition. The present improvement, to cost \$62,700, is largely on new alignment and is designed to cross the tracks of the Northwestern Pacific Railroad via an overhead crossing which is proposed for construction in the near future. With the advent of increased ferry service from San Francisco to Tiburon this route will carry a considerable portion of the traffic using the Redwood Highway and will do much to alleviate the present congestion at the Sausalito terminal.

An improvement to another of California's scenic highways will be the widening and surfacing of three short sections of the road which extends from the Redwood Highway, north of Cloverdale, to the coast at Navarro Head. While this lateral is only 50 miles in length, it traverses an increasingly popular recreational section of the coast country, passing through the beautiful redwood groves of the Paul Dimmick Park. The expenditure on this improvement will be \$92,600.

The steady improvement of the ever popular Redwood Highway is shown by the construction of an overhead crossing 2.5 miles north of Beatrice in Humboldt County. It will consist of two 61'-7" through plate girder spans, one 40-foot steel beam span and 450 feet of timber approach trestle; the concrete piers and steel bents are to have pile foundations and the timber trestle will be constructed on pile bents. This structure will separate the grades of the main line of the Northwestern Pacific Railroad and the State Highway which is now under construction on the new

alignment between Laleta and the existing road some three miles north of Beatrice. This new alignment, including a subway at Laleta, which is now under construction, and the present overhead structure, will eliminate a very narrow and crooked section of the existing road as well as shorten the distance by 1.5 miles. This structure will be erected at a cost of \$52,800.

VICTORY HIGHWAY

Contracted to cost \$225,000 is an important improvement on the heavily traveled road from Sacramento to the high Sierras and Reno via Auburn. The work proposed consists of boring a tunnel, with a 30-foot roadway and 531 feet long, and constructing about one mile of approaches, through the hill and under the town of Newcastle, some 3 miles west of Auburn. This new location of the State Highway will eliminate the necessity of through traffic climbing the excessive grades at both the east and west entrances of Newcastle and passing through the congested area of the town and the existing narrow subway under the tracks of the Southern Pacific Railroad. The portions of the tunnel near the portals and beneath the Southern Pacific Company's tracks will be lined with reinforced concrete. The remaining portions will have timber lining. The placing of the ultimate Portland cement concrete pavement will be postponed until the fills in the approaches to the tunnel have fully settled, at which time the approaches and tunnel will be paved as a unit.

PACIFIC HIGHWAY

At Lincoln, in Placer County, nearly two miles of the Pacific Highway is to be graded and paved with 20 feet of Portland cement concrete. This project is on an improved alignment of the road through the town and includes the construction of two small bridges. This project, which will cost \$70,400, will close the gap in the pavement on this route, between Sacramento and Red Bluff.

WORK ADVERTISED

Work advertised for bids during the past month includes the following important projects:

CASTAIC CREEK BRIDGE

A reinforced concrete girder bridge consisting of seven 35-foot spans on concrete pile bents and concrete abutments with pile foundations and having a clear roadway width of 34 feet will be constructed across Castaic Creek on the Los Angeles to Bakersfield road in Los Angeles County. This new structure will be built on an improved alignment at this crossing and will replace the existing 8-span steel through girder bridge which was built by the county some 15 years ago on an inferior alignment.

BAY SHORE EXTENSION

The further improvement of the Bay Shore Highway is noted by the advertising for bids for the construction of a 60-foot graded roadbed on the sector from Redwood City to Willow Road. This important alternate route down the Peninsula is now graded and surfaced from San Bruno avenue in San Francisco to 5th avenue in San Mateo. The portion from 5th avenue, San Mateo, to Redwood City is now under construction and the present project will carry the Bay Shore Highway 4 miles nearer to San Jose. The termination of this project is Willow Road which is the main connection between the Coast Route and the Dumbarton Bridge across the bay.

County Reports on State Highway Projects

COLUSA COUNTY

Construction of 13 miles of new State Highway, between Bear Creek and 5 miles west of Williams, on the Ukiah-Tahoe Highway under contract by Le Tourneau, is practically completed on 4 miles of the Williams end of the work. The contractor has begun on the Bear Creek end of the work, and proposes to work east from there to connect with the completed 4 miles. Construction is ahead of schedule and will probably be completed prior to May, 1931, the date set for completion.

A 24-foot graded roadbed is to be built from Bear Creek to the mouth of Salt Creek Canyon and from there to the junction with the present highway a 36-foot graded roadbed is planned. Surfacing of this project is scheduled to begin prior to the middle of next year.

The work between Williams and Maxwell, consisting of construction of a 39-foot new grade alongside the present 15-foot concrete pavement, is being constructed ahead of schedule by Frederickson-Watson Construction Co., Contractor. The excavation of the drainage ditch, which is being done to afford material for roadway embankment, is completed. At the present rate of progress, the work will be finished by the latter part of September of this year.

EL DORADO COUNTY

Construction of a new roadbed between Bay View Rest and one mile north of Eagle Falls is under contract by Nate Lovelace. The mountainous country through which the route is projected necessitates a large volume of roadbed retaining wall. The wall is being constructed of selected material obtained along the work.

FRESNO COUNTY

The Peninsula Paving Company have begun paving on the contract for improvement between 3 miles south of Fresno and 3 miles south of Fowler.

GLENN COUNTY

The concrete paving project between Logandale and Willows, under contract by Basich Bros. Construction Co., was begun the latter part of May. The earth roadbed, and the pit-run gravel blanket course for the concrete pavement, is half finished. The contractor is placing pavement forms at the Willows end of the work, preparatory to placing the 20-foot wide Portland cement concrete pavement.

INYO COUNTY

Beginning at the southerly boundary of Inyo County, Route 23, Fred W. Nighbert has recently completed a 10-mile stretch of State Highway to Little Lake, from which point north he also has under construction an additional 4-mile stretch, which will be completed within the next two weeks. At this point a connection is made with the Allied Contractor's, Inc., contract, which extends 21 miles to Olancha, which when completed, will close the gap and give a continuous paved highway to the northerly boundary of Inyo County.

Other reports by counties will be found on page 22.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MEEK-----Director
GEORGE C. MANSFIELD-----Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 8 SEPTEMBER, 1930 No. 9

1931 License Plate Form is Approved

The 1931 colors for automobile license plates will be exactly the same as this year except that they will be reversed.

Instead of black letters and numerals on an orange background, it was stated, orange letters will appear on a black background, just as they were in 1929.

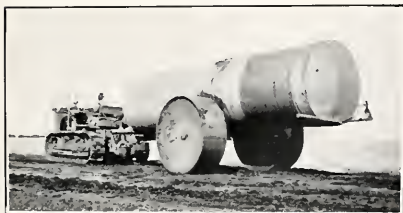
Exhaustive tests for visibility, the division's announcement said, have proven beyond all doubt that these colors are the most satisfactory and that numbers may be read at a greater distance than with any other combination.

The only change in the general appearance of next year's plate will be the elimination of the dashes between numerals and letters. This will be done to improve the plate's appearance and will not decrease visibility.

The plates will be 13½ inches long and 6½ inches wide as provided by the Motor Vehicle Act. They will be manufactured of the same grade of 24-gauge steel.

The same combination of letters and numerals that has proven so satisfactory in the last two years will be used. The division announced that a maximum of 2,070,000 plates of not more than six characters may be issued with this arrangement.

A REAL WATER WAGON



Water tank of 6000 gallons capacity for compacting, by watering, newly placed roadway fills on the new state highway now being constructed between Bear Creek and five miles west of Williams on the Ukiah-Tahoe highway route.

"A RADIO MIX UP"

Submitted by a reader of Napa Grange Bulletin.

Following is the experience of a man who bought and installed a radio. He tuned in getting three stations on the same wave length. One was a minister, one a man telling the condition of the roads, and the third was a lecture on poultry. Here is what he heard:

The Old Testament tells us that baby chicks should detour one mile south of the salina and listen to the words of the prophets. Be careful in the selection of your eggs, and you will find hard-surfaced roads to Garden City. We find in Genesis that the roads are muddy just west of the hen house and clean straw is essential if you would save your soul. After passing through Marysville, turn north to Jericho.

Three wise men brought a large-size incubator on account of the bad detour. The baby chicks were troubled with pip and a bond issue is being talked of in the Holy City. Keep the feet clean and dry, live a life of righteousness and turn south one mile west of the school house. Much care should be taken in commanding the sun to stand still, as there is a wash-out on the bridge just south of Scotia, and the road to salvation is under repair, making it necessary for 70 degrees in the brood house at all times. After Garberville, unless you do those things the wrath of the Lord will cause the pin feathers to fall out.

Many are called, but few have any luck unless the gravel road between Rohnerville and Ferndale is mixed with feed. The Lord commanded Noah to build the ark just one mile west of Ukiah. It rained for forty days and forty nights and caused an eight-mile detour.

Just west of the brood house many tourists from the house of David are trying the Plymouth Rocks mixed with concrete and a desire to do right.

SHADE

By Theodosia Garrison

"The kindest thing God ever made,
His hand of very healing laid
Upon a fevered world, is shade.

His glorious company of trees
Throw out their mantles, and on these
The dust-stained wanderer finds ease.

Green temples, closed against the beat
Of noontime's blinding glare and heat,
Open to any pilgrim's feet.

The white road blisters in the sun:
Now, half the weary journey done
Enter and rest, O weary one!

And feel the dew of dawn still wet
Beneath thy feet, and so forget
The burning highway's ache and fret.

This is God's hospitality,
And whoso rests beneath a tree
Hath cause to thank Him gratefully."

Few women are color blind, except in the matter of distinguishing red and green traffic lights.—Florence (Ala.) *Herald*.

Compiling Data
on Irrigation
Districts

Sacramento Flood
Control Construc-
tion Program
Adopted

Review of August Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Study of Dams
in California
Progressing

Water Rights;
Adjudications and
Permits, Applica-
tions

IRRIGATION, WATER STORAGE DISTRICTS

In connection with the assembling and completion of data on water supply and other matters of interest to irrigation districts in California for the purpose of bringing Bulletin No. 21 up to date, the following irrigation districts were visited: Modesto, Turlock, Waterford, Oakdale, West Stanislaus, Merced, El Nido, Madera, Corcoran, Lakeland, Alta, Island No. 3, Alpaugh, Lindsay-Strathmore, Terra Bella, Vandalia, Fair Oaks, Citrus Heights, Carmichael, Camp Far West, Paradise, Deer Creek, Anderson-Cottonwood, El Camino, Glenn-Colusa, Jacinto, Princeton-Codora, Byron-Bethany, East Contra Costa.

An appraisal of the lands of the El Nido Irrigation District was made. Plans for proposed irrigation works for the district were submitted to the State Engineer for review.

As a result of the hearing held at Buttonwillow, Tulare County, on July 16, 1930, the State Engineer, on petition of landowners, issued an order for the exclusion of certain lands from the Buena Vista Water Storage District.

A petition was received by the State Engineer petitioning the exclusion of about 1300 acres of land from the Tulare Lake Basin Water Storage District, located in Kings County. The hearing on this petition for exclusion has been set for October 14, 1930.

Request for approval of a bond issue in amount of approximately \$135,000 has been submitted to the California Bond Certification Commission by the Directors of the El Nido Irrigation District.

The California Bond Certification Commission has approved the private sale of \$350,000 par value of bonds of the El Dorado Irrigation District at 94 per cent and has issued an expenditure order to the same district authorizing expenditures in amount of \$364,000 for the construction of the Webber Dam for storing approximately 9000 acre-feet of water.

DAMS

The activities of the Department have, during this period, been directed primarily to the completion of a preliminary examination of all existing dams, compilation and study of hydrographic data upon which to base wasteway requirements and the basic stress determination of masonry dams. Technical assistance has been rendered the Water Resources Investigation in the selection of typical sections for high gravity dams.

To date 690 applications have been filed with the Department for approval of existing dams and dams under construction.

Applications received for approval of plans and specifications for construction:

Dam	County	Owner	Estimated cost
Swanzy Lake	Solano	Calif.-Hawaiian Sugar Refining Company	\$66,000
Tiger Creek	Amador	Pacific Gas & Electric Company	350,000

The Swanzy Lake Dam is an earthen structure to be built as a regulating reservoir for use in the Sugar Company's water supply project.

Tiger Creek Dam is to be a slab and buttress type for use as a regulating and balancing reservoir in the P. G. & E.'s Electra system.

Applications received for approval of plans for repair or alteration.

Dam	County	Owner
Kelly Lake	Placer	Pacific Gas & Electric Company
Mell Pond	Modoc	Crane Creek Lumber Company
Meadow Lake	Alpine	Pacific Gas & Electric Company

Plans approved for repair or alteration.

Dam	County	Owner
Notre Dame	San Mateo	College of Notre Dame

Activities on dams built prior to August 14, 1929.

Preliminary inspections have now been made on practically all the dams in the state. The inspection reports are being digested and segregated.

Spillway requirements have been furnished through the Water Resources Investigations Department on all dams.

Office studies for determining the safety of design are nearing completion.

Geological examinations are being made of all major structures.

The results of the various activities are being combined and the department will soon be able to divide the dams into three main groups, i. e.:

1. Dams which can be approved.
2. Dams which need repairs or alterations.
3. Dams which require further study.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The work during this period in connection with flood control maintenance has been mostly routine, including miscellaneous repair work and irrigation of willows. In addition clearing of second growth timber has been

carried on in the by-passes. A total of twenty-eight men have been engaged in this work during the period.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

The work of constructing a sandfill and payment at Isleton under contract by O. G. Ritchie will be completed by August 30.

Work is now under way on the installation of two current retards on the right bank of the Sacramento River on the Davis property, eleven miles above Colusa, to cost \$8,200, in cooperation with Reclamation District No. 2047.

Arrangements have been completed for the construction of three current retards on the Campbell and Dwyer Ranch two miles below Colusa in cooperation with the Sacramento River West Side Levee District. The total cost is \$7,632.

SACRAMENTO FLOOD CONTROL PROJECT

Approximately sixty-four men have been engaged during this period in clearing operations in the Sutter By-pass. The clearing work being done under five contracts in the Feather River Bottoms near Marysville is approximately 80 per cent completed.

On July 16 the Reclamation Board approved a program for new construction on the Sacramento Flood Control Project for the fiscal year 1930-31. This program was presented in a report submitted by a committee appointed by the Reclamation Board consisting of Stephen W. Downey, A. M. Barton, R. L. Jones, B. A. Etcheverry and F. C. Hermann, and has since been approved by the California Debris Commission. The program follows:

	U. S.	State	Local	Total
West Intercepting Canal, right of way.....		\$5,000	-----	\$5,000
Deficit, Starr Bend Levee.....	\$2,610	1,305	\$1,305	5,220
Deficit, Lake of the Woods, Levee.....	10,500	5,250	5,250	21,000
By-pass clearing.....	-----	36,500	-----	36,500
Removing old levees, Feather River.....	-----	7,500	-----	7,500
Controlling works at Nelson Bend, Feather River.....	5,000	5,000	-----	10,000
Feather River clearing, below Marysville.....	-----	5,000	-----	5,000
American and Sacramento R. clearing.....	-----	2,000	-----	2,000
West Yolo By-pass Levee: Liberty Farms.....	18,480	9,240	9,240	36,960
Sullivan and Roche.....	15,820	7,910	7,910	31,640
Reclamation Dist. No. 2068.....	12,840	6,420	6,420	25,680
Yolo By-pass, East Levee, Dist. 785.....	23,980	11,990	11,990	47,960
Feather R. Levee, Dist. 784.....	38,385	38,385	-----	76,770
Moulton Weir.....	64,580	33,500	-----	98,080
Reclamation Board administration.....	-----	25,000	-----	25,000
Totals.....	\$192,195	\$260,000	\$42,115	\$436,810

RUSSIAN RIVER JETTY

The work of depositing rock in the Russian River Jetty has been continued with a force of eight men operating the quarry and railroad. The jetty now extends approximately 300 feet from the shoreline and the channel through the bar is open along the north side of the jetty, having a depth of 10 feet at high water and a width of about 150 feet. There is no indication that this channel will be closed during the balance of the summer months. The present work will be continued for approximately three months longer.

NAVARRO RIVER JETTY

The construction of the rock jetty on the Navarro River under contract by Christie and Allen is approximately one-half completed and it is expected the whole work will be completed by October 30.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

Forty applications to appropriate water were received during the month of July, 14 applications were canceled and 27 were approved. Six permits were revoked, 4 licenses were issued and 1 license was revoked.

Applications received which were of more than ordinary interest are as follows: The application of Little Rock Creek Irrigation District to appropriate 3000 acre-feet from Little Rock Creek tributary to Antelope Valley in Los Angeles County. Estimated cost of project \$65,000. Applications of Fresno Irrigation District to appropriate from San Joaquin River in Fresno and Madera counties for irrigation and power purposes. Cost of project not stated. Applications of Pacific Gas & Electric Company to appropriate from Tiger Creek and Panther Creek, tributaries of Mokelumne River, for power purposes. Estimated cost of project \$40,000,000. Application of McGrath Brothers, D. C. Smith and S. A. McKeehan, et al, Meridian, California, to appropriate from Butte Slough in Sutter County for the irrigation of 5245 acres. Application of Bear Gulch Water Company to appropriate from San Francisco Creek in San Mateo County for municipal purposes. Estimated cost of project \$325,000. Applications of Sacramento Municipal Utility District to appropriate from Silver Creek tributary of American River in El Dorado County for municipal, domestic, irrigation and power purposes. Estimated cost of project \$26,500,000.

Permits issued which are of more than ordinary interest are those of M. J. and H. E. Newkom, Yuba City, California, to appropriate from Feather River at an estimated cost of \$13,570, and Fallbrook Irrigation District to appropriate from Santa Margarita River in San Diego County for irrigation and domestic purposes, 10,000 acres, at an estimated cost of \$1,400,000.

ADJUDICATIONS

Shasta River (Siskiyou County): Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties): Still pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County): Submission of referee's final report still being withheld pending negotiations now in progress towards settlement of one of the important issues.

Oak Run Creek (Shasta County): Case still pending in Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County): Case still pending in the Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County): Case still pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Altos Creek (Santa Barbara County): Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County): Negotiations relative to a consent judgment still being carried on.

Mill Creek (Modoc County): The trial schedule of distribution proposed by the Division of Water Resources was administered by a water master throughout the month.

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

Franklin Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

WATER DISTRIBUTION

Little Shasta River (Siskiyou County): Water master service on this stream was continued throughout the month.

Pit River (Modoc and Lassen Counties): Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River Investigation.

Hat and Burney Creeks (Shasta County): Water master service on these streams was continued throughout the month.

North Cove, Oak Run and Cloner Creeks (Shasta County): Water master service on these streams was continued throughout the month.

Davis, Emerson, Mill, Owl and Soldier Creeks (Modoc County): Water master service on these streams was continued throughout the month.

Lower Shasta River (Siskiyou County): Water master service was continued throughout the month.

West Fork of Carson River (Alpine County): Water master service was started on this stream for the 1930 season on July 21st.

SNOW SURVEYS

Office work in the past month has consisted in computations and preparation of diagrams in determining the relation between snow, precipitation, temperature, and run-off for the various basins. A statement of expenditures in the past year and budget for 1930-31 have also been completed.

In the field work two trips were made: one to Bear Valley in the Mokelumne basin to install a shelter for the equipment used on the Bear Ridge course, and the other to the Feather and Yuba basins to relocate the Lassen and Mount Stover courses, to establish a new course in Church Meadows near Gold Lake, to establish Jackson Meadow and relocate Findley Peak courses, and to arrange for a new precipitation observer at Downieville in the Yuba basin. The relocated Lassen course is adjacent to Lake Helen at an elevation of about 8100 feet.

In the surveys of the past winter and spring, the men encountered many varied, interesting, and at times hazardous experiences. Our attention has been called to the fact that certain of these might be of interest to include in the staff report. One incident in connection with the Sanislaus basin survey was of particular interest.

The snow course is located at Lake Alpine on the Ebbetts Pass road. Three men skied in leaving from Angels Camp and taking four days to reach the course. One man, who is the owner of a resort at Lake Alpine, was new to snow travel and hence the delay. Also, the men had to carry the provisions for the intermediate stops. The resort at Lake Alpine was previously stocked with food and bedding. On the way in the men found that someone had been breaking into cabins all along the road and when they reached Lake Alpine they found an occupant in their cabin making himself at home with their provisions and supplies. Although one of the men carried a gun, the occupant appeared too formidable to start a quarrel with which would necessarily have to last the entire time the men would be at the course.

Briefly, the snow surveyors jollied the trespasser along and finally persuaded him to accompany them, on one pretext or another, on the return to Angels Camp. There they succeeded in turning him over to the Sheriff and after he was safe behind the bars, the Sheriff told the surveyors that they had brought in an ex-convict.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued. Office work has included the preparation of maps of irrigated areas and new schedules for the salinity observers, showing for each the times for sampling during the next six months.

The salinity investigation has been continued by the maintenance of sampling at 37 bay and delta stations, and by establishing nine new stations as the salinity has advanced into the delta. The six tide gages have been maintained and in the past month three new gages were installed in the vicinity of Courtland to secure data in connection with the proposed diversion of Sacramento River water through Snodgrass Slough.

On August 6th the salinity in parts of chlorine per 100.000 was as follows: Bullshead Point 1290; O. and A. Ferry 430; Collinsville 400; Antioch 315; Jersey 75; Emmaton 74; Webb Pump 26; Rio Vista 10; Isleton 6. On the same date, the discharge of the Sacramento River at Sacramento was about 2500 second-feet, and the San Joaquin River near Vernalis was discharging 660 second-feet, making a combined flow to the delta of 3160 second feet. The corresponding Sacramento, San Joaquin, and the combined discharges on August 6, 1929, were 2740, 665 and 3405 second-feet, respectively.

WATER RESOURCES

SAN JOAQUIN VALLEY INVESTIGATION

Ground Water Investigation. Maps delineating the elevation of the ground water for the areas from Madera to Kern County have been completed for the years 1921 to 1929, inclusive. Maps have also been prepared showing the depth to ground water as of October 1, 1929 for all the wells in these same areas. Quantitative estimates have been made of the underground storage capacities of possible absorptive areas in the upper San Joaquin Valley.

Land Classification. Further field examinations are being made of the foothill and low mountain areas extending east of the San Joaquin Valley floor.

Irrigation Requirements. Month by month studies have been completed for each of the main stream basin divisions of the upper San Joaquin Valley showing irrigation requirements, yields from local supplies and requirements for imported water, utilizing underground as well as surface storage.

Water Supply. Detailed studies have been made to determine the yield of the San Joaquin River at Friant for exportation southward under various assumptions: 1. Utilizing only surplus water and waters adapted to this so-called "grass land." 2. Utilizing the entire flow of the stream.

San Joaquin Pumping Plan. Further studies have been made on plans for pumping water up the San Joaquin River to supply the irrigation demands below Mendota in exchange for San Joaquin River water.

Engineering Advisory Committee. A meeting was held on August 14 and 15 of the Engineering Advisory Committee on San Joaquin Valley investigations. The work completed during the past month was reviewed and plans were made for the investigation which will result in determination of a possible first unit in the San Joaquin Valley.

SACRAMENTO VALLEY INVESTIGATION

Water Supply. Estimates of the present impaired run-off of the American River at Auburn, Coloma and Folsom dam sites and the Yuba River at the Upper Narrows were completed. The run-off studies for the Trinity River were extended to cover the season of 1928-1929.

Irrigation Yield Studies. Irrigation yield studies were made for reservoirs on all the major streams of the Sacramento Basin including Kennett on the Sacramento River, Oroville on the Feather River, Narrows on the Yuba River, Camp Far West on the Bear River and Folsom, Auburn and Coloma reservoirs on the American River, assuming that the power head available at the dam would not be reduced to a point below one-half maximum. Further studies were made of the irrigation yield at Red Bluff on the Sacramento River with the Trinity River diversion operated in conjunction with the Kennett reservoir. Studies are now in progress to determine the economic installed capacity of power plants at the various reservoirs.

Irrigation Requirements. Estimates of the ultimate irrigation requirements in the Sacramento Valley have been completed. These estimates have been approved by the Engineering Advisory Committee. A study of the amount of return that would be available from the application of the irrigation water is being made together with its probable distribution through the year.

Flood Flow Studies. Studies of flood flows with their probabilities and concentrations have been continued through the month.

Cost Estimates. Sections to be used in estimating the costs of demand at the various sites together with unit costs of the principal items of construction have been approved by the Engineering Advisory Committee.

Geologic Reports. A geological investigation and report of the Iron Canyon and Kennett dam site were made by Dr. F. L. Ransome. A preliminary report on the geology of the Fairview dam site on the Trinity River has been completed by Dr. Louderback.

Exploration Work. A second exploration pit has been started at the Iron Canyon dam site during the past month and is now practically completed. The exploratory work at Kennett dam site has been continued. Up to the present time about 1400 feet have been driven under the direction of Colonel Robins.

American River Investigation. Sampling and testing of water at various stations on the American River has been continued throughout the month.

SALT WATER BARRIER INVESTIGATION

Field work on the survey of industrial development, public water supply systems and industrial water front structures was practically completed during the past month and work started on the compilation and analysis of the detailed data which have been gathered. Detailed surveys have been made on over 120 industries, 22 public water supply systems, and about 350 industrial water front structures, all within the area extending from Antioch and Rio Vista on the east to Richmond on the south and west. The economic studies of the industrial development are actively under way under the direction of the committee composed of:

Prof. W. E. Hotchkiss, Dean, Stanford Graduate School of Business, Chairman.

Prof. H. S. Grady, Dean, Graduate School of Business U. C.

A. D. Schindler, Consulting Engineer.

Professor George W. Dowrie, Consulting Economist of the Stanford Graduate School of Business, is engaged with this committee in making the detail economic studies, including the compilation and preparation of all data pertinent to the past and future growth and trend of industrial development in the bay region, and particularly the area affected by the barrier.

A large part of the work during the past month has been devoted to the preparation of basic data required for estimating the consumption of and demand for water from the proposed barrier lake, including all uses by industries, municipalities, agriculture and use of water by natural vegetation and by evaporation. Special studies on the important item of evaporation and transpiration have been largely completed. This has involved the gathering of all available records of evaporation and related meteorological data and intensive studies to determine the variation and distribution of evaporation as applied to various areas related to the several proposed barrier locations. Similar studies have also been under way and largely completed on transpiration from natural vegetation, especially the aquatic growths of tules and cat-tails and the native salt grass and salt marsh and fresh water vegetation. Detailed data on the consumptive use of water by crops within the delta region of the delta region of the Sacramento and San Joaquin rivers and the cropped areas have been determined and compiled. Field surveys were completed on the classification of the Suisun Bay marsh land area which forms what is hoped to be a rich potential agricultural area. In this connection, aerial photographs covering a large part of the area made by the U. S. Army Engineers on their cooperative investigations with the state have been of tremendous value. Soil surveys are also under way covering the Suisun Bay area and classification and soil surveys will also be immediately started in the San Pablo Bay marsh area.

Substantial progress has been made on the gathering of detailed data in regard to reclamation within the delta. Complete data has been obtained on a large number of the more important and larger reclamations. This data is of special importance in the study which must be made of the effect of the proposed barrier on the present reclaimed area within the delta, with special regard to the levees and the drainage and irrigation operations.

SALINITY INVESTIGATIONS

During the past month work has been continued on the preparation of final maps, diagrams, tables and other data for the report covering the results of field work and office studies on salinity investigations in the Sacramento-San Joaquin Delta and upper bay region. Final revised data is under preparation for the determination of the final relations which will be established as between stream flow, tidal action and variation of salinity within the tidal basin, and finally, the relation as to the amount of stream flow required for control of salinity at various points in the tidal basin.

Work in the field has included the maintenance of between 30 and 40 regular salinity observation stations covering the entire tidal basin from San Pablo Bay upstream through the delta and in addition the maintenance of automatic tide gage stations throughout the tidal basin.

Field work in connection with spreading works and flood control channels is virtually completed at this

time on San Antonio, Cucamonga, Deer, Day, City and Mill creeks and also the small creeks immediately north of the city of San Bernardino. Office computations were begun about thirty days ago and it is expected to have all of this work completed by September 15th. When this is done a complete system of spreading works and flood control works for the entire Santa Ana River and tributaries above Lower Santa Ana Canyon in Riverside and San Bernardino counties will have been laid out as part of the Water Resources Investigation. No work is being done in Orange County as that work was the subject of inquiry by Orange County Flood Control District and is being reexamined by a board of consulting engineers at the present time.

MOJAVE RIVER INVESTIGATION

No field work was done during the month but work of laying out a map of the basin was continued in the Sacramento office. This is being done from photographs of an aerial survey which gives an immense amount of detail and the resulting map will be very comprehensive and complete.

The Arrowhead Lake Company which owns Arrowhead Lake, a resort in the San Bernardino Mountains on a tributary of the Mojave River, furnished a large amount of data on run-off of some 16 tributaries of the Mojave which were susceptible of being diverted into Arrowhead Lake and also a large amount of data on run-off in the Mojave Valley. These data were gathered for the purpose of a lawsuit which was held many years ago between the water users of the Mojave River and the Arrowhead Company. The Arrowhead Company built the dam which makes Arrowhead Lake and proposed to divert the water which could be impounded behind the dam to the coast side of the mountains but was enjoined. Since that time and up to 1922, the company continued to maintain a great many of the gaging stations and rainfall stations. These data when analyzed will be very valuable for purposes of the report and will be also valuable from the general standpoint in getting the rainfall run-off relation in southern California mountains—something which has been needed for many years. Up to this time the Arrowhead Company has never made these data available except in general form but now has turned over to this office all original data. The expense of analyzing these has proven unexpectedly high because of the large amount of data but it is expected that the office will be well repaid when the work is completed.

SOUTH COASTAL BASIN INVESTIGATION

This is the investigation for which an emergency appropriation of \$10,000 was made by the Department of Finance about July 1st. Some progress was made in this. Because of the peculiar situation in southern California it is not advisable to proceed with a great amount of field work until the territory has been thoroughly organized. As there are a large number of agencies gathering data throughout the entire field and which will continue to gather and make them available for use by the state, it was thought advisable to form a committee consisting of the chief engineers and technical heads of the various organizations doing such work for the purpose of securing their advice and correlating their work. A meeting was held on July 29th which all attended and it was agreed that the best way to start this and inform the public as to what is being done now would be for each to write a short article of between two and three thousand words describing the work under his supervision and the aim of the research work. This matter is to be published as a bulletin of the state and marks the first step in coordinating the various activities

of the basin. Those forming the committee may be divided into four groups: sewage research workers and chief engineers, flood control district chief engineers, governmental research bodies and University of California research bodies. At the present time eight men are on the committee and it will probably be advisable to add to this.

It has been also found desirable to organize the people of South Coastal Basin in various committees in order to provide a medium through which field data can be obtained more readily and through which can be disseminated any information gathered by the state. This work was taken up and some committees organized. The Los Angeles County Conservation Association expects to aid materially in this, particularly on the west coast, south coast and San Gabriel Valley. Field and office work in obtaining capacities of the 29 underground reservoirs in the area was started August 7th.

SANTA CLARA VALLEY AND NAPA COUNTY INVESTIGATIONS

Office work in connection with these two investigations is proceeding in anticipation of completion of a progress report before the close of the year.

MISCELLANEOUS ACTIVITIES

LOCATING STEAM GAGING STATIONS

Field trips were taken with representatives from the U. S. Engineer's office and the Water Resources Branch of the U. S. Geological Survey for the establishment of stream gaging stations (with automatic recorders) on the Sacramento River at Verona, Thomas Creek near Paskenta, Middle Fork of the Feather River at Bidwell Bar, South Fork of the Feather near Enterprise, North Fork of the Yuba River below Goodyear Bar, Middle Fork of the Yuba below Freeman's Crossing, North Fork of the American River at Rattlesnake Bridge, and West Branch of the Feather River at Nelson's Bar. These are reconnaissance trips in the program for the location of some 18 new gaging stations and the installation of recorders at 18 old stations throughout the Sacramento-San Joaquin drainage basin in accordance with a federal-state cooperative agreement.

SHORE PROTECTION

A member of the State Engineer's office has been appointed on a committee to serve with interested agencies in the matter of beach protection immediately west of Santa Monica and along the Malibu Range. Other members of the committee are the representatives of the county of Los Angeles, city of Santa Monica, beach frontage owners and Division of Highways, State of California.

MOTOR VEHICLE DIVISION REPORTS

(To Governor's Council August 28th)

FRANK G. SNOOK, Chief

REGISTRATION DATA

As of August 1, the Division had registered 1,997,161 automobiles, solid and pneumatic trucks, motorcycles, and solid and pneumatic trailers.

3019 automobile dealers have been registered, 72 motorcycle dealers and 46 trailer dealers.

During the first seven months, 323,065 transfers have been handled.

As of August 1, the Division has collected a total of \$8,398,377.64 in motor vehicle fees.

In the month of July, 12,920 nonresident permits were issued, making a total for the year of 47,845.

HIGHWAY PATROL

The California Highway Patrol has been busily engaged during the past few months in their various activities, and the patrolmen have assisted in handling congested traffic in several communities during conventions and meetings. During the American Legion Convention approximately 60 men were brought to Sacramento to work with the local police detail in handling the Legion Parade. Their general appearance was splendid and their support was certainly appreciated by the Sacramento Police Department and the American Legion Parade Committee.

The Highway Patrol school has been transferred from the State Fair ground and is now located at Mather Field. They have been assigned a large barrack for housing the men, a separate one for the kitchen, and mess hall, and one hangar has been allotted them for whatever use necessary. It is felt that this arrangement will be very beneficial to the Patrol. The fourth class is expected to be called soon after September 1.

HEADLIGHT ADJUSTMENT ACTIVITIES

The Bureau of Lights has inaugurated a program for testing headlight stations and adjusters, as well as enforcing the provisions against the motorist. As of August 1, the Division has authorized 1125 official headlight adjusting stations, with approximately 4500 adjusters. Arrangements have been made to inspect all stations regularly each four months.

From April to July an examination was given to 3000 adjusters and it was found that periodical examinations of the adjusters, as well as the stations, will prove of great benefit to the motoring public. In many cases we found that old adjusters had not acquainted themselves with changes in the law, which was of vital importance to them. On July 1, the men working on a night patrol were instructed to spend at least one hour each night with the testing screen in testing lights. In those counties having night patrols, the day squads assist in a night raid once a week. In those counties without night patrols, the day squads conduct two raids each week. Under this new program, the enforcement work increased 93 per cent in July and June. In June, there were 9469 motorists stopped for test and 3864 arrested. In July, 18,258 were stopped and 6457 arrested. For the first seven months of 1930, 71,752 vehicles have been stopped and tested, and 29,442 arrests have been made.

BRAKE TESTING PROGRAM; TRUCKS ARE EXAMINED

The Bureau of Brakes and Commercial Vehicles has launched an extensive campaign during the past four months. Instructions were issued the patrolmen to stop at least one truck or more each day for a complete check of possible violations and this activity has resulted in a general "brushing up" along lines of enforcement that have been ignored in the past. The truck owners generally have taken heed and are equipping their trucks with the necessary safety appliances, such as mirrors, mechanical signals, and clearance lights, all of which are necessary to the safe operation of a truck, and tend to protect the other motorists on the road. This enforcement has also increased the number of trucks weighed, arrested for overloads, and bad rubber.

As of August 1, this Bureau has received 1439 applications for brake-testing stations of which 997

have been issued permits. The remaining 375 are pending or incomplete. Many of these have been issued permits during August. There has been 214 men authorized as official brake adjusters, as of August 1.

From April 1 to July 31, 4997 trucks have been stopped in the general checkup of which 1977 have been arrested for flagrant violations pertaining to destruction of roads. The remaining numbers have been warned and instructed in regard to proper equipment. This total does not include trucks stopped for defective lights or minor infractions.

Since April 1, the patrol has tested brakes on approximately 100,000 cars. It is gratifying the manner in which the public has taken to this work, and to date not a single complaint has been received regarding the manner in which these tests have been conducted.

AUGUST REPORT OF DIVISION OF ARCHITECTURE

(To Governor's Council, August 28th)

GEORGE B. McDUGALL, Chief

Work for which contracts were awarded during August-----	\$84,857
Projects on which bids are in but awards not yet made-----	1,327,994
Projects now out for bids-----	57,500

PROJECTS PLACED UNDER CONTRACT

List of projects for which contracts were awarded during the month of August, 1930.

Allen dam, Preston School of Industry; installing sprinkler system and piping system, Pacific Colony; sidewalks, Pacific Colony; general work, kitchen and commissary building, Whittier State School; plumbing, heating and ventilating work, kitchen and commissary building, Whittier State School; electrical work, kitchen and commissary building, Whittier State School; reconstructing retaining wall, San Francisco State Teachers College.

PROJECTS ON WHICH BIDS ARE PENDING

Bids were received on the following projects during the month of August but no award has as yet been made.

California State Building at Los Angeles: General work, \$639,000; plumbing work, \$47,673; heating work, \$33,383; ventilating work, \$16,850; electrical work, \$48,804; elevators, \$47,900; structural steel, \$128,775; granite work, \$199,385.

San Jose State Teachers College: Gymnasium Building: general work, \$114,836; electrical work, \$7,403; plumbing, heating and ventilating work, \$26,488.

San Diego State Teachers College: Service connections, \$17,407.

The car had come to a sudden standstill on a country road. The motorist descended, diagnosed the trouble, and then applied at a neighboring cottage for assistance.

"Pardon me," he said to the old woman who answered his knock, "do you by any chance possess any lubricating oil?"

The old woman shook her head.

"Any oil will do," said the motorist, hopefully: "castor oil, if you have any."

"I ain't got it," replied the old woman, "bnt I could fix you up with a dose of salts."

COUNTY REPORTS ON STATE HIGHWAY PROJECTS

(Continued from page 14.)

KERN COUNTY

The construction of the State Highway has been completed from Mojave north as far as Cinco, a distance of approximately 17 miles, where we encounter the George Herz Company contract. This contract is that portion of the State Highway under construction through the famous Red Rock Canyon, for a distance of some 15 miles, beyond which a completed State Highway is encountered for the following 20 miles, to the northerly boundary of Kern County, which means that when the George Herz Company completes its contract, which extends from Cinco to 7 miles north of Ricardo, Route 23 will have been paved throughout the length of Kern County.

A. Teichert and Son, Inc., started work August 7, 1930, which provided for 14 miles of oil-treated crushed rock surfacing on the Kern Canyon Highway, between Cottonwood Creek and Democrat Springs.

Shoulder oiling along Route 4 and 57 has been completed by C. M. Duntley, Contractor.

Completion of grading and surfacing between San Emidio Road and Route 4 is progressing steadily. V. R. Dennis Construction Company are the Contractors.

The Valley Paving and Construction Company are now starting macadam surfacing on their contract on Route 33, between the west line of Kern County and Junction Pumping Station, a distance of 15.5 miles. The contract will probably not be completed before February of next year, but when finished will eliminate the last unpaved portion of Route 33 in Kern County.

KINGS COUNTY

Shoulder oiling on Route 10 has been completed.

LAKE COUNTY

The approximate 6-mile section of armor coat surfacing between Upper Lake and Ukiah on the Blue Lakes section of Route 15 was completed by state forces in June. With work previously done, this puts this highway in an excellent condition for summer tourist travel from the Redwood Highway to the "Beautiful Lakes" region of California.

State forces have completed oil treating 10.6 miles of 20-foot wide crushed stone surfacing recently placed, by contract, on a new graded highway between Lucerne and Clear Lake Oaks.

Widening of the roadbed to 24 feet between Sweet Hollow Summit and Abbott Mine is complete.

From Abbott Mine to Bear Creek, Colusa County, the construction of a new 24-foot graded roadbed is one-third finished. Work is on schedule, and, at the present rate of progress will be completed by the early part of next year.

MADERA COUNTY

No major contract work in progress since completion of Califa line change. Shoulder oiling work has been completed.

MARIN COUNTY

The contract of Granfield, Farrar and Carlin for grading the 4.1-mile section of Route 1 on the Redwood Highway, between San Rafael and Alto was accepted June 16th by the Director.

Work was started on a surfacing contract for the same section by the same contractor on the tenth of June. This surfacing project calls for the placing of 6-inch crusher run base and 2-inch emulsified asphalt macadam 30 feet in width.

The reinforced concrete overhead structure at the Northwestern Pacific Railroad tracks at Greenbrae under contract with Siemer & Kendall and F. J. Main, has been completed.

The 150-foot steel truss span overhead crossing the Northwestern Pacific tracks at California Park on this section under contract with Frederickson and Watson Construction Company and Frederickson Bros. is complete with the exception of a little painting work yet to be done.

The bascule bridge under contract with the Butte Construction Company at Corte Madera Creek, Greenbrae has been completed with the exception of the bascule span, which is in process of erection. This structure, together with the surfacing contract of Granfield, Farrar and Carlin should be completed about the same time in August, allowing traffic to enjoy full use of the completed highway between Alto and San Rafael, with a shortened distance between these points of two and one-half miles.

The 1.8-mile section of the Redwood Highway north of San Rafael, also under contract to Granfield, Farrar and Carlin, was opened to traffic on July 26th; the overhead crossing to Forbes Station on this project, under contract to Rocca & Coletti, having been completed just previous to the finishing of the surfacing work. This project called for grading a 40-foot roadbed with 20-foot pavement for 1.3 miles and 50-foot roadbed with 20-foot pavement for 0.5 mile. Pavement over the compacted sections of roadbed being of concrete and over the newly graded portions of bituminous macadam. (See special article attached.)

Bids were taken on July 23d for constructing 1.3 miles of Route 52 between Alto and Tiburon. Graded roadbed will be from 36 to 56 feet in width with bituminous macadam surface 20 feet wide.

MARIN AND SONOMA COUNTIES

The contract of the Hanrahan Company for constructing the 11.9-mile section of Route 1, Redwood Highway, between Ignacio in Marin County and Petaluma in Sonoma County is nearing completion. The date set for the finishing of this work is the twenty-fifth of September. The contractor has consistently been up to or slightly ahead of his schedule in the progress of this work so it is expected that this will be fully completed by that time. All the grading work and the 9 miles of concrete pavement 20 feet in width called for under this contract has been completed and the bituminous macadam on the balance is well under way.

MENDOCINO COUNTY

The Basalt Rock Company, working with State Maintenance Forces completed the application of light fuel oil on 38 miles of State Highway, Route 48, McDonald-to-the-Sea, early in June. This highway carries heavy traffic on holidays and Sundays due to the beauties of the Navarro River, the Redwoods and State Park, which offers delightful camping grounds with fishing and swimming and other outdoor sports.

The application of armor coat to the 8 miles of Redwood Highway between Ukiah and Forsythe Creek was completed by State Maintenance Forces about the middle of July.

The placing of asphaltic road oil under contract with A. Teichert & Son of Sacramento for 12 miles of Redwood Highway between Cloverdale and Hopland for armor coat work, being handled by State Maintenance Forces, is nearing completion. This should be fully completed late in July.

MONO COUNTY

The State Highway extending from Mattly Ranch to Leevining, a distance of approximately two miles, is nearing completion by C. Miles, Contractor, which should be completed about the middle of August.

Approximately 12 miles of State Highway construction is being advertised for early letting between Sonora Junction and four miles south of Coleville. This portion of the State Highway follows the Walker River, which when completed, will add materially to the accessibility of the country east of the high Sierras.

District contracts have recently been completed for the oiling and road-mixing of about 40 miles of highway, upon which there has been no permanent construction. The first of these pieces extends from the summit of Sherwin Hill to Devil's Punch Bowl, 24 miles, the second extending from Devil's Punch Bowl to Leeving, which also includes a short stretch through the town of Bridgeport.

MONTEREY COUNTY

The bridge across the Salinas River on the Coast Highway at San Ardo is nearing completion. Ben C. Gerwick is the contractor under the supervision of the Bridge Department. The approaches to the bridge have been completed by Frederickson and Watson and Fredrickson Brothers, Contractors.

A contract has been awarded to H. E. Doering for the construction of a new bridge across the Salinas River on the Coast Highway at Bradley. This work is under the supervision of the Bridge Department.

On the San Simeon-Carmel Highway a timber bridge is being constructed across Alder Creek. The Dean Construction Company, Contractor, has established a camp near the site. The Bridge Department has supervision of this work.

Two convict camps are maintained on the San Simeon-Carmel Highway. Camp 15 at Salmon Creek has a crew of 90 men and Camp 18 at Little Sur has a crew of 70 men. Camp 15 is to be moved to Willow Creek during August and will thereafter be known as Camp 22. Surveys and plans are in progress between the two camps.

Surveys are in progress for relocating San Simeon-Carmel Highway from Rocky Creek to Carmel through Carmel Highlands.

NEVADA COUNTY

Grading and oil-treated stone surfacing between Nevada City and one mile west of Washington Road on the Ukiah-Tahoe Highway will be completed within another month. C. R. Adams has the contract for the work.

PLACER AND NEVADA COUNTIES

Grading of the highway between Airport and Soda Springs, a part of the Dutch Flat-Donner Lake wagon road, by T. E. Connolly, who has the contract for the first 9½ miles, and by Callahan Construction Co., Inc., who has the contract for the last 10½ miles, is being completed as rapidly as possible to permit the placing of crushed stone surfacing which has been contracted for on the entire length of the new grade.

SAN BENITO COUNTY

Surveys are in progress for the elimination of San Juan Grade between Salinas and San Juan Bautista. A careful study is being made to locate the line in a position that will preserve the natural beauty of Pineate Rocks along the route. About 10 miles of the road has been located. This project is located in San Benito and Monterey counties.

SAN LUIS OBISPO COUNTY

Very satisfactory progress is being made on the reconstruction of the Coast Highway between the Santa Maria River and Los Berros Creek. This is a 20-foot Portland cement concrete pavement on a 36-foot roadbed. Placing the pavement is complete. J. F. Knapp is contractor.

Plans are complete for the construction of a 20-foot concrete pavement across the bed of the Santa Maria River. This is a dry weather detour around the through steel truss bridge, one span of which collapsed on June 10th, 1930. The wrecked span will be replaced by a temporary trestle to carry traffic during high water.

Bids were received on July 23d on the reconstruction of the Coast Highway between San Luis Obispo and Cuesta Grade, a distance of about three miles.

On the Cholame Lateral a seal coat is being applied to the bituminous macadam surface between Estrella River and the Sacramento Ranch, a distance of about six miles. The Granite Rock Company is the contractor.

SAN MATEO COUNTY

The contract with the H. W. Rohl Company for grading and surfacing that section of the Bayshore Highway between the southerly city limits of San Francisco and the northerly city limits of the city of South San Francisco has been practically completed. The operations of this Contractor, however, have been extended by special arrangement to some grading and temporary surfacing within the city of South San Francisco on the adjoining section of this major highway. A heavy fill is being made in the vicinity of Linden avenue in order to give this fill the benefits of the compaction due to the winter rains and the carrying of the heavy traffic using this road. This work should be completed early in August.

The next important link of the Bayshore Highway between South San Francisco and Broadway, Burlingame, 5.2 miles, was recently awarded to the Basch Bros. Construction Company of Los Angeles. Work is to be commenced on this section of a 40-foot width concrete pavement early in August and should be completed before the first of the year.

The 7.3-mile section of the Bayshore Highway under grading contract to Frederickson & Watson Construction Company and Frederickson Bros., from San Mateo to Redwood Slough, Redwood City, is about 60 per cent complete. The Contractor on this work being about one month ahead of schedule. Progress on the hydraulic fill portion of this roadway has been a slightly retarding factor, but as this work is practically completed and unless unforeseen circumstances arise, this work should also be completed by the first of the year.

The adjoining section of Bayshore Highway to the south for grading from Redwood Slough to Willow Road, a distance of 4.1 miles, will be advertised for bids at an early date.

SANTA CLARA COUNTY

Work on the contract of the Hanrahan Company for grading and paving between Palo Alto and San Antonio Road, a distance of 4.1 miles is about half completed. Approximately two miles of paving full 30-foot width has been placed from Matadero Creek to San Antonio Road. This job has been consistently behind schedule but should be completed before the first of the year.

The center link of the major section of the Peninsula Highway from Palo Alto to Santa Clara, being 4.9 miles in length, between San Antonio Road and Sunnyvale has also been awarded to the Hanrahan Company. Work was started on this section late in June. This project calls for resurfacing the existing 20-foot pavement with asphalt concrete and widening with a 10-foot strip of concrete to a 30-foot paved width throughout on 50-foot graded roadbed within a 100-foot right-of-way. With the completion of this unit in early 1931 the public will enjoy the use of the widened, resurfaced 14-mile section between Palo Alto and Santa Clara on an alignment vastly superior to that which previously existed.

A 10.7-mile section of Route 32, the Pacheco Pass Highway, between San Felipe and Bell Station for grading and surfacing with bituminous macadam on a vastly improved alignment will be advertised in the early fall of this year. This project is an important link in the major plan for a fast highway between the San Joaquin Valley and the bay districts of California.

SANTA CRUZ COUNTY

A contract for grading and surfacing 2.7 miles of State Highway, Route 42, between Saratoga Gap and Waterman Switchback was awarded to O. A. Lindberg of Stockton in July, work being started about the middle of this same month. This project, which calls for 243,000 cubic yards of roadway excavation will greatly improve the alignment and shorten the dis-

tance of this beautiful section of roadway leading through the Redwoods from its connection with the Skyline Boulevard at Saratoga Summit to the California Redwood Park at Big Basin. The contract time limit has been set at January 14, 1931, so that the public will be fully enjoying the benefits of the coming holiday season.

SONOMA COUNTY

One mile of State Highway, Route 51, between Schellville and Sonoma and 2.9 miles between Sonoma and Beltrane has been surfaced with an armor coat, work being completed early in July. The furnishing and placing of asphaltic road oil was done under contract with A. Teichert & Son, of Sacramento. Furnishing and placing of all rock being done by State Maintenance Forces. This highway carries an extremely heavy summer traffic due to the many resorts and hot springs of Jack London's famous "Valley of the Moon."

TULARE COUNTY

No major projects in Tulare County since completion of the 26-foot A. C. widening and resurfacing between Pixley and Tipton, by the California Construction Company.

The paving, which involved 33,750 tons, was completed between April 7 and May 23. The contract was completed over two months in advance of the contract time.

Shoulder oiling on Routes 4 and 10 has been completed.

YOLO COUNTY

Construction is scheduled to soon begin for grading and paving with asphalt concrete 5.8 miles of State Highway between Williams and Maxwell. Bids for the work were received July 9.

YUBA COUNTY

A 20-foot Portland cement concrete pavement through Wheatland has been completed by C. W. Wood, the contractor. Minor drainage structures, and rock borders, are yet to be done before the contract is completed.

OPENING TO TRAFFIC A NEW SECTION OF THE REDWOOD HIGHWAY

An important link in the Redwood Highway of the State Highway System, just north of San Rafael, will be opened to traffic for the first time on Saturday morning, July 26th.

Although only 1.8 miles in length, this section of highway saves over one-third of a mile in distance over the previous location. It extends from the northerly city limits of San Rafael to a connection at Gallinas Creek with the recently constructed concrete pavement to Ignacio.

The present project is paved with Portland cement concrete and bituminous macadam 30 feet in width on a 50-foot width graded roadbed for the first one-half mile north of San Rafael, the balance being paved 20 feet in width on a 40-foot graded roadbed.

An overhead crossing structure over the Northwestern Pacific Railroad tracks is provided at Forbes, approximately one and one-half miles north of San Rafael.

This project is a part of the nearly completed major plan of relocation and widening of the Redwood Highway of that section between Sausalito and Santa Rosa, which will net an ultimate saving in distance of approximately 5 miles between these cities. This project is an outstanding one, with long sweeping curves, easy grades, elimination of railroad grade crossings and a minimum sight distance of 600 feet, so essential to the safety of the traveling public.

LIST OF HIGHWAY BIDS AND AWARDS

For July and August

COLUSA COUNTY—Reinforced concrete girder bridge across Bear Creek about 28 miles west of Williams consisting of seven 31-foot spans on concrete bents. Dist. III, Rt. 15, Sec. D. Geo. J. Ulrich Const. Co., Modesto, \$22,792; Whipple Engineering Co., Monrovia, \$28,400. Contract awarded to R. B. McKenzie, Red Bluff, \$19,966.

COLUSA COUNTY—Three concrete girder bridges across Salt Creek about 1 mile north of Williams, across Freshwater Creek, 13 miles north and across Green Valley Slough 4 miles north of Williams. Dist. III, Rt. 7, Sec. B. Geo. J. Ulrich Const. Co., Modesto, \$18,833; Whipple Engineering Co., Monrovia, \$26,532. Contract awarded to Fredrickson & Watson Const. Co., Oakland, \$18,127.

DEL NORTE COUNTY—Between southerly boundary and Wilson Creek, 12.7 miles to be surfaced with oil treated crushed gravel or stone. Dist. I, Rt. 1, Sec. A. Heafey Moore Co., Oakland, \$98,470; Hein Bros., Basalt Rock Co., Petaluma, \$100,523; M. J. Bayanda, Stockton, \$114,764; Enklehart Paving & Const. Co., Eureka, \$95,497; J. T. Holland, Inc., San Francisco, \$100,694. Contract awarded to Hemstreet & Bell, Marysville, \$88,405.50.

EL DORADO COUNTY—Between Fresh Pond and 3 of a mile east of Riverton on Placerville-Tahoe route, 6.2 miles bituminous surfacing treatment. Dist. III, Rt. 11, Secs. F-G. Finnell Co., Inc., Sacramento, \$8,720; A. Teichert & Son, Sacramento, \$8,226. Contract awarded to F. C. Adams, Angels Camp, \$5,994.

EL DORADO COUNTY—Reinforced concrete bridge across the So. Fork of the American River at Riverton. Dist. III, Rt. 11, Sec. F. Hector Williamson, Placerville, \$38,283; Geo. J. Ulrich Const. Co., Modesto, \$30,194; Finnell Co., Inc., Sacramento, \$34,436. Contract awarded to Ralph Hunter, Sacramento, \$25,106.90.

FRESNO COUNTY—Between Fowler switch canal and Fancher Creek, 7.6 miles to be graded and paved with asphalt concrete. Dist. VI, Rt. 4, Secs. A-B. A. Teichert & Son, Sacramento, \$296,668; Valley Paving Co., Visalia, \$280,594; Geo. R. Curtis Paving Co., Los Angeles, \$299,993; Steele Finley, Santa Ana, \$284,339. Contract awarded to Peninsula Paving Co., San Francisco, \$257,557.30.

HUMBOLDT COUNTY—Overhead crossing over Northwestern Pacific R. R., 23 miles north of Eatrice, Broadway Highway. Dist. I, Rt. 1, Sec. 3. Emil Force, Piedmont, \$66,961; Henry Padgett, Fields Landing, \$55,985; Smith Bros., Eureka, \$55,813; Mercer-Fraser Co., Eureka, \$51,693. Contract awarded to Fred J. Maurer & Son, Eureka, \$50,320.30.

HUMBOLDT COUNTY—Between $\frac{1}{2}$ mile south of Eureka and Eureka, 0.6 of a mile to be graded and paved with Portland cement. Dist. I, Rt. 1, Sec. G. Mercer-Fraser Co., Eureka, \$23,700; J. V. Galbraith, Petaluma, \$27,198. Contract awarded to Enklehart Paving Co., Eureka, \$22,043.

KERN COUNTY—Between 13 miles east of Cottonwood Creek and Democrat Springs, 13.9 miles of surfacing with oil treated gravel. Dist. VI, Rt. 57, Secs. F & G. P. Holland, Inc., San Francisco, \$14,814; G. W. Ellis, Los Angeles, \$144,240; Hartman Const. Co., Bakersfield, \$141,433. Contract awarded to A. Teichert & Son, Sacramento, \$141,335.

LOS ANGELES COUNTY—Between Castaic School and Santa Clara River, 4.3 miles to be widened with bituminous treated rock borders. Dist. VII, Rt. 4, Sec. A. Fred W. Nighbert, Bakersfield, \$21,105; Gibbons & Reed Co., Burlingame, \$18,225. Contract awarded to Southwest Paving Co., Los Angeles, \$16,425.

LOS ANGELES COUNTY—Between 1.3 miles and 13.9 miles north of Castaic School 12.6 miles, portions to be surfaced with bituminous macadam. Dist. VII, Rt. 4, Sec. B. Gibbons & Reed, Burlingame, \$139,420; McCray Co., Los Angeles, \$140,590; V. R. Dennis Const. Co., San Diego, \$184,020; G. W. Ellis, Los Angeles, \$145,390; Fred W. Nighbert, \$149,988. Contract awarded to Southwest Paving Co., Los Angeles, \$134,330.

MONO COUNTY—Between Mono Lake and the foot of Conway Grade, 8.8 miles furnishing and applying heavy fuel oil as dust layer. Dist. IX, Rt. 23, Sec. H. G. M. Duntley, Los Angeles, \$5,301; Gilmore Oil Co., Los Angeles, \$5,621; California Road Oil

Service Co., Wilmington, \$5,317. Contract awarded to Leonard C. Pulley, Long Beach, \$4,981.50.

NEVADA COUNTY—Between Boca and Iceland, 7820 lineal feet laminated timber guard rail. Dist. III, Rt. 38, Secs. A-B. Arthur Mitchell, Sacramento, \$6,842; Ralph Hunter, Sacramento, \$7,116; L. C. Seidel, Oakland, \$7,585; I. Greitzen & Son, Sacramento, \$7,741. Contract awarded to Geo. E. McDonald, Marysville, \$5,484.90.

PLACER COUNTY—Through Newcastle, 531 feet of tunnel and 1 mile of roadway approaches to be graded and surfaced with crusher run base treatment. Dist. III, Rt. 17, Sec. B. T. E. Connolly, San Francisco, \$298,132; Ward Engineering Co., San Francisco, \$272,996; Fisher & Bonny, San Francisco, \$260,352; George Pollock Co., Sacramento, \$249,999; J. G. Donovan & Son, Los Angeles, \$308,121; W. S. Mead, Oakland, \$241,627. Contract awarded to T. M. Morgan Paving Co., Los Angeles, \$209,755.25.

PLACER AND NEVADA COUNTIES—Between Airport and Yuba Pass on the Victory Highway 7.2 miles to be surfaced with crusher run base and untreated crushed gravel or stone. Dist. III, Rt. 37, Secs. B-A. A. Teichert & Son, Sacramento, \$129,367; T. E. Connolly, San Francisco, \$147,405; Hein Bros., Basalt Rock Co., Petaluma, \$151,915; Chas. Harlowe, Oakland, \$144,448. Contract awarded to Tieslau Brothers, Berkeley, \$122,807.60.

RIVERSIDE COUNTY—Between northerly boundary and 1 mile west of Beaumont, 6.2 miles of existing roadbed to be widened. Dist. VIII, Rt. 26, Sec. A. Match Bros., Elsinore, \$38,533; Gist & Bell, Arcadia, \$43,711; F. J. Akmadzich, Los Angeles, \$50,779; Monarch & Breen, Inc., San Diego, \$39,924; Watson & Sutton, San Diego, \$37,932. Contract awarded to Steele Finley, Santa Ana, \$34,402.

SACRAMENTO COUNTY—Between Twin Cities School and $\frac{1}{2}$ mile N.E. of Herald, 4.6 miles crushed gravel with bituminous surfacing 3 feet borders on each side of existing pavement. Dist. X, Rt. 34, Sec. B. J. R. Reeves, Sacramento, \$9,204; A. Teichert & Son, Sacramento, \$9,967; L. C. Seidel, Oakland, \$10,390; Pereira & Reed, Tracy, \$7,224.80.

SACRAMENTO COUNTY—Between 1 mile south of Arno and Cosumnes River, 2.6 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 4, Sec. A. C. W. Wood, Stockton, \$100,015; N. W. Ball, Porterville, \$96,164; Basich Bros., Const. Co., Los Angeles, \$103,303; T. M. Morgan Paving Co., Los Angeles, \$99,973; M. J. Bevanda, Stockton, \$129,602. Contract awarded to Fredrickson & Watson Const. Co., Oakland, \$89,029.30.

SAN BERNARDINO COUNTY—Between 6 miles east of Amboy and $\frac{1}{2}$ miles east of Essex, 28.7 miles to be graded and surfaced with oil treated crushed gravel or stone. Dist. VIII, Rt. 58, Sec. K-L. New Mexico Const. Co., Alburquerque, N. M., \$579,519; T. G. Donovan & Son, Los Angeles, \$669,790. Contract awarded to George Herz & Co., San Bernardino, \$507,402.95.

SAN DIEGO COUNTY—Between La Posta and Tecate Divide, 8.4 miles of heavy fuel oiling. Dist. VII, Rt. 12, Sec. P. V. R. Dennis Const. Co., \$15,510; Calif. Road Oil Co., Wilmington, \$15,329; Gilmore Oil Co., Los Angeles, \$15,171. Contract awarded to Leonard C. Pulley, Long Beach, \$13,366.80.

SAN DIEGO COUNTY—Between Viegas Creek and Pine Valley about 11.2 miles to be paved with Portland cement concrete. Dist. VII, Rt. 12, Sec. D. Will F. Peck Co., Los Angeles, \$387,382; Watson & Sutton, San Diego, \$373,600; Basich Brothers, Los Angeles, \$338,793; Jahn & Bressler, Los Angeles, \$240,226; Griffin Company, Los Angeles, \$340,782; R. E. Hazard Const. Co., San Diego, \$363,235; Wells & Bressler, Santa Ana, \$369,282; E. Paul Ford, East San Diego, \$340,677. Contract awarded to Sander Pearson, Santa Monica, \$338,287.

SAN JOAQUIN COUNTY—Between Forest Lake and northerly boundary, 1.4 miles to be graded and paved with asphalt concrete. Dist. X, Rt. 4, Sec. D. Heafey-Moore Co., Oakland, \$59,581; Valley Paving Co., Visalia, \$62,162; Clark & Henery Const. Co., San Francisco, \$57,457.90.

SAN LUIS OBISPO COUNTY—Oiling shoulders, Ascadero to Paso Robles. Dist. V, Rt. 2, Sec. B. M. J. Bevanda, \$4,439; V. R. Dennis Const. Co., San Diego, \$8,287; Irvin L. Ryder, San Jose, \$8,298; Steele Finley, Santa Ana, \$9,275; A. Teichert & Son, Sacramento, \$11,259. Contract awarded to Hartman Const. Co., Bakersfield, \$6,277.40.

SAN MATEO COUNTY—Between South San Francisco and Burlingame, 5.2 miles to be graded and paved with Portland cement concrete. Dist. IV, Rt. 68, Sec. B. Hanrahan Company, San Francisco, \$411,254; J. F. Knapp, Oakland, \$435,169; Eaton & Smith, San

Francisco, \$443,487; C. W. Wood, Stockton, \$475,338; Frederickson & Watson, Oakland, \$427,854; Jahn & Bressler, Los Angeles, \$437,963; N. M. Ball, Porterville, \$423,507; T. M. Morgan Paving Co., Los Angeles, \$413,314. Contract awarded to Basich Brothers Const. Co., Los Angeles, \$402,982.

SANTA BARBARA COUNTY—Constructing oil-rock shoulders between El Capitan Creek and 1 mile south of Tajiguas Creek, about 4 miles. Dist. V, Rt. 2, Sec. F & G. M. J. Bevanda, \$13,434; E. T. Carter, Santa Barbara, \$15,007. Contract awarded to Santa Maria Const. Co., Santa Maria, \$11,344.65.

SANTA BARBARA AND SAN LUIS OBISPO COUNTIES—Between the 2d crossing of the Cuyama River and the easterly boundary of San Luis Obispo County, 37.9 miles to be graded and surfaced with oil treated crushed gravel or stone. Dist. V, Rt. 57, Secs. B, C, D. M. J. Bevanda, Stockton, \$283,740; A. Teichert & Son, Sacramento, \$367,818; J. F. Holland, San Francisco, \$374,996; V. R. Dennis Const. Co., San Diego, \$358,693; H. W. Rohl Co., Los Angeles, \$354,342; Chas. U. Heuser, Glendale, \$359,891; Allied Contractors, Inc., Omaha, Nebr., \$458,969; G. W. Ellis, Los Angeles, \$312,880; Peninsula Paving Co., San Francisco, \$491,338; Irving L. Ryder, San Jose, \$315,557. Contract awarded to Lang Transportation Co., Los Angeles, \$261,612.90.

SISKIYOU COUNTY—Reinforced concrete bridge across Shasta River about 73 miles north of Yreka. Dist. II, Rt. 3, Sec. C. Pacific Bridge Co., Portland, Oregon, \$111,190; Ward Engineering Co., San Francisco, \$102,283; M. B. McGowan, San Francisco, \$103,977; Bodenhamer Const. Co., Sacramento, \$106,582. Contract awarded to Rocca & Calletti, San Rafael, \$97,884.

SISKIYOU COUNTY—Reinforced concrete girder bridge across Klamath River 10 miles north of Yreka. Dist. II, Rt. 3, Sec. C. Ward Engineering Co., San Francisco, \$80,538; Pacific Bridge Co., Portland, \$77,985. Contract awarded to Rocca & Calletti, San Rafael, \$77,779.

TRINITY COUNTY—Bridge across Trinity River near Douglas City. Dist. II, Rt. 20, Sec. E-A. M. E. McGowan, San Francisco, \$86,754; Fred J. Maurer & Son, Eureka, \$85,010; Rocca & Calletti, San Rafael, \$101,425. Contract awarded to Whipple Engineering Co., Monrovia, \$83,000.

YOLO COUNTY—Between Bretona & Dunnigan, 5.8 miles to be graded and paved with asphalt concrete. Dist. III, Rt. 7, Sec. C. Clark & Henery Const. Co., San Francisco, \$147,265; A. Teichert & Son, Sacramento, \$133,214; Heafey-Moore Co., Oakland, \$148,275; Valley Paving Co., Const. Co., Visalia, \$144,271. Contract awarded to Jones & King, Hayward, \$129,575.75.

ARCHITECTURAL AWARDS

For July and August

STATE FAIR GROUNDS, Sacramento—Construction cattle corrals, awarded to Guth & Fox of Sacramento, \$4,866.

FOLSOM STATE PRISON—Contract for sheet metal work on the Cell Block, Administration and Hospital Building, awarded to Frank Z. Ahl, Sacramento, \$5,994.

CALIFORNIA SCHOOL FOR BLIND, Berkeley—Contract for general work, Annex to School Building and Annex to Residence for Boys, awarded to Sorensen & Haggmark, San Francisco, \$45,700.

Contract for plumbing and heating work on the above awarded to Geo. A. Schuster of Oakland, \$5,262.

Contract for electric work on the above awarded to Geo. Woolf of Oakland, \$1,783.

PRESTON SCHOOL OF INDUSTRY, Ione—Contract for constructing Allen Dam awarded to Geo. French, Jr., of Stockton, \$14,300.

PACIFIC COLONY, Spadra—Contract for installing Sprinkler System and Piping System awarded to American Engineering Co. of Los Angeles, \$4,250.

Contract for sidewalks in above institution awarded to C. C. Cline of Upland, \$2,394.

WHITTIER STATE SCHOOL, Whittier—Contract for general work on Kitchen and Commissary Building awarded to Adolf G. Schmid of Santa Ana, \$53,260.

Contract for plumbing, heating and ventilating on the above awarded to F. B. Jones of Pasadena, \$8,178.

Contract for electrical work on the above awarded to R. R. Jones Electric Co., So. Pasadena, \$1,525.

(Continued on next page.)

REPORT ON FIVE SEASONS' STUDY OF SACRAMENTO- SAN JOAQUIN AREA

(Continued from page 6.)

factor in alleviating the shortage of water for navigation and for the delta is the return water; the water which has been diverted in excess of the actual requirements of the crops, and which, returning to the river, is again available for use.

WATER SUPERVISOR FUNCTION

The ultimate relief for the conditions as described lies, of course, in conservation by storage and the successive development as demanded of projects such as are being worked out for the conservation and utilization of the water resources of the Sacramento-San Joaquin Valley in connection with the State-Wide Water Resources Investigation. Prior to these developments, however, there is much that can and must be done in the way of conservation of the existing water supply and determination of water rights, or at least determination of the extent of water uses under the various water rights claimed.

SCOPE OF WORK

The work of the Water Supervisor is broadly divided between two fields: (1) the engineering investigation, measurements, collection of records and data, etc., and (2) the conservation efforts, waste prevention, and such administration of the stream flow, as shall fall within the jurisdiction of the Division of Water Resources or be mutually agreed upon by the water users.

THE ENGINEERING INVESTIGATION

This has comprised measurements and records of all diversions of water from the Sacramento, Feather, Yuba, American and lower San Joaquin rivers within the valley floor and above the delta; stream flow measurements throughout the territory, largely in cooperation with the Water Resources Branch, U. S. Geological Survey; measurements and records of waters returned

to the Sacramento and San Joaquin rivers; studies of the consumptive use of water on peat and sedimentary lands in the delta region in cooperation with the U. S. Department of Agriculture, Division of Agricultural Engineering, and the University of California Agricultural Experiment Station; an annual census of irrigated areas and crops under all diversions recorded throughout the delta; and investigation and study of the advance and retreat of salinity in the delta channels and upper bays.

CONSERVATION FEATURES

In connection with this phase of the Water Supervisor's work, the greater or lesser requirement for conservation measures in the seasons of 1924 to 1929, inclusive, is indicated in the following table which gives the run-off and minimum stream flow figures for those years.

Run-off and Minimum Flow 1924-1929

Year	Entire run-off to San Francisco Bay in per cent of normal	Minimum flow at Sacramento	In second-feet San Joaquin River near Vernalis
1924	27	705	391
1925	78	2,760	660
1926	55	1,330	565
1927	108	3,420	1,290
1928	75	2,510	840
1929	41	2,300	565

The most critical season was that of 1924, the driest year of record, and it was the impending crisis, evident as early as January of that year, which set in motion the steps to effect the necessary conservation through the River Problems Conference, its permanent committee and the Water Supervisor. Through the medium of a water users agreement the signers pledged themselves to exercise their respective rights to use of water in such a manner as to accomplish the maximum degree of water conservation and to at all times refrain from acting in any way to hinder or prevent the Water Supervisor in the execution of his work. On all of the larger projects, conservation officers were appointed to work with the supervisor in the detection and prevention of waste and valuable assistance was rendered in this connection. A report of the work in 1924 and the success attendant upon the measures effected in that season has been published in detail in Bulletin No. 4 and needs no elaboration here. Suffice it to say that when the most critical time came about the middle of July, and it seemed that portions of the delta area faced disaster due to the salinity encroachment, the appeal to up-river water users for further diversion reductions and the effective operation of the waste prevention and curtailment program proved suc-

ARCHITECTURAL AWARDS

(Continued from page 25.)

SAN FRANCISCO STATE TEACHERS COLLEGE—Contract for reconstructing retaining wall awarded to Mission Concrete Company of San Francisco for \$950.

SAN JOSE STATE TEACHERS COLLEGE—Contract for electrical work on Men's Gymnasium, awarded to Guilbert Bros. Electric Co., of San Jose, \$7,403.

Contract for plumbing, heating and ventilating work on the above awarded to Hateley & Hateley, Sacramento, \$26,488.

cessful, beyond all expectation, in meeting the situation.

In the 1925, 1927 and 1928 seasons the necessity for strenuous conservation measures was considerably lessened and the work in these seasons, therefore, was confined largely to the engineering investigation. There were, however, certain conservation efforts and actions demanded to greater or lesser extent in connection with such features as navigation and the gun clubs, in every year.

In 1926, as shown in the table, the seasonal run-off to San Francisco Bay was only 55 per cent of normal and although conditions were not as serious as in 1924 a considerable effort was required to effect the greatest water savings and relief for the up-river navigation and delta irrigation and salinity difficulties. The procedure was similar to that of 1924 and again the work was carried on almost entirely through appeals to the water users for waste prevention and reduction of diversions where possible. It is to be noted that in both 1924 and 1926 the conservation measures effected were purely voluntary and there was no enforcement of any particular schedule of water diversions agreed upon by the water users.

THE PERMANENT COMMITTEE

Emphasis should be given to the great value in the conservation work and in the entire investigation, of the Permanent Committee of the Sacramento-San Joaquin River Problems Conference. Since the first conference this committee has functioned actively and has proven to be a powerful influence in welding together the divergent interests involved, in bringing about constructive cooperative effort and in preventing litigation in the face of critical situations that have arisen. In this committee and the River Problems Conference there has been created a most fortunate medium for dealing with the problems involved; and at present, the committee, both as representing the water users and as consultant to the division, stands as the proper body to forward an administrative schedule for water distribution or any constructive plans of this nature for bettering the situation.

WATER USERS ORGANIZATIONS

In a territory as large as that of the Sacramento-San Joaquin, difficulty is encountered in making contact and dealing with such a large number of individual water users. However, in any program for conservation or in the development of a schedule for water allocation based upon mutual agreement, all should of course be included. The solution of

this difficulty would appear to be the formation of local water users associations, combining in each association those water users in a particular locality where there are local problems of common interest or where there is some particular situation which sets that locality apart from others. The Division of Water Resources, Water Supervisor and permanent committee, could then deal with these associations, thus reaching through them, with facility and dispatch, all of the water users. A step in this direction, resultant from the 1926 shortage for irrigation, was the action taken by districts and water companies on the Sacramento River in organizing the Knights Landing North Water Users Association. This association, as the name implies, includes all Sacramento River users north of Knights Landing. As stated in its constitution the purpose was to form an organization

* * * to the end that the low water flow of the river may be so used and conserved as to avoid friction and litigation among diverters
* * * and to work with the United States War Department in charge of navigation on the Sacramento River, the State Division of Water Resources, and the permanent committee of the Sacramento-San Joaquin River Problems Conference in all questions of policy regarding the use of water from the river.

Such an organization can greatly facilitate conservation work and all dealings with the water users within it, and the possibility and advantage of either the formation of similar associations or the reorganization of existing ones so that the entire Sacramento-San Joaquin territory would be covered, is worthy of consideration.

THE THRICE BLEST HIGHWAY

By PLATT YOUNG, in Georgia Highways Magazine

I drove along the crowded thoroughfare
Where busy marts of men in commerce there
Rich wares displayed, to tempt the asking eye
And bulging purse of chanceful passerby.
Each hurried throng upon some mission went
With happy those on simple pleasure bent.

I drove along the quiet country lane
Past promised fields of cotton, corn and grain,
Where neighbors knew that tiring, dull remorse
Dissolved at once in friendly intercourse;
Where some were wont to borrow, some to lend—
A godly interchange from friend to friend.

When next I sought the mountain's rugged crest
I found a mountain lake within a nest
Of lofty pines, while smiling overhead
A crescent moon its silver radiance spread.
Three things were mine to bless this common sod:
Swift commerce, friendship, and a glimpse of God.

Passenger (in speeding bus passing town): "This is rather a nice looking town, wasn't it?"

MID-SUMMER TRAFFIC CENSUS ON STATE HIGHWAYS SHOWS NORMAL INCREASE

(Continued from page 1.)

Station location	July, 1929		July, 1930		Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14		Sun. 14	Mon. 15	Sun. 13	Mon. 14
E. on C.R.	366	228	427	270	E. on C.R.	2,185	1,912	2,205	2,325
N. on L.	2,250	1,613	1,906	1,520	S. on 2.	26,028	13,380	25,027	11,457
Mountain House at Jct. Rt. 48 to Roomerville.					San Mateo S. of Cy. at 16th Ave. Redwood Cy. N. of Cy. Lts.	27,084	15,124	31,616	15,470
S. on L.	2,350	1,688	2,918	1,676	Palo Alto at Highway to Federal Tel. Sta.	23,944	12,851	26,830	12,915
W. on 48.	432	278	226	254	9 Mi. N. of San Jose.				
N. on L.	1,954	1,492	1,706	1,424	N. on 2.	12,815	8,038	10,944	7,063
Hopland at Jct. Rt. 16 to Lake- port.					W. on C.R.	3,574	4,801	4,599	2,171
S. on L.	2,247	1,874	2,159	1,792	S. on 2.	8,414	5,286	13,373	7,811
E. on 10.	711	787	931	793	5 Mi. N. of San Jose.	9,697	6,990	12,360	8,622
N. on L.	2,948	2,643	3,025	2,591	4 Mi. N. of San Jose.	12,516	11,332	14,747	12,969
Ukiah S. of Cy. Lts. Jc. with Rt. 70.					San Jose N. of City Lts. at Lum- ber Yard.	19,938	21,579	24,151	22,753
S. on L.	2,340	2,003	2,421	2,298	San Jose S. of Cy. Lts.	19,433	8,342	10,733	8,427
E. on 70.	1,061	1,006	921	1,079	5 Mi. S. of San Jose.	8,133	4,965	9,176	5,522
N. on L.	3,136	2,747	3,054	3,108	10 Mi. S. of San Jose.	8,250	5,077	8,446	5,258
Ukiah N. of Cy. Lts. at Jc. Rt. 15 to Colusa.					15 Mi. S. of San Jose.	8,130	4,894	8,522	4,952
S. on L.	2,691	2,235	2,786	2,670	Gilroy N. of Cy. at Jc. with Mt. Madonna Rd. to Watson- ville.				
E. on 15.	1,919	749	1,112	862	N. on 2.	8,205	6,187	8,948	6,395
N. on L.	2,025	1,623	2,014	2,050	W. on C.R.	1,287	778	1,085	1,273
Willits N. of Cy. at Jc. C.R. to Sherwood.					S. on 2.	8,429	6,357	9,055	6,421
S. on L.	1,486	1,371	1,589	1,510	Route 2. (District V)				
W. on C.R.	72	106	62	76	San Juan Bautista N. of Cy. at Jc. with Rt. 67 Chittenden Rd.				
N. on L.	1,915	1,268	1,532	1,437	N. on 2.	5,427	3,393	5,972	3,567
Mendocino-Humb. Co. Line	1,261	1,164	1,245	1,174	W. on 67.	3,697	1,533	3,801	1,623
Garderville at Jc. with C.R. to Brievland.					S. on 2.	4,784	3,079	5,507	3,370
S. on L.	1,511	1,482	1,908	1,687	San Juan Bautista S. of Cy. at Jc. Rt. 22 to Hollister.				
W. on C.R.	392	178	319	186	N. on 2.	5,411	3,797	4,912	3,498
N. on L.	1,689	1,573	2,062	1,808	E. on 22.	3,001	1,780	3,351	2,113
Deerville at Jc. C.R. to South Fork.					N. on 2.	3,741	2,822	4,340	3,048
S. on L.	2,326	1,620	2,262	1,691	S. on C.	3,243	2,387	3,115	2,729
E. on C.R.	329	452	355	395	S. Rt. Mon. Co. Lne.	6,395	5,190	8,096	7,192
N. on L.	2,224	1,533	2,161	1,539	S. of Cy. Lts.	4,883	4,482	5,277	4,797
W. on C.R.	261	187	189	132	Gonzales 3 Mi. N. of Town.	3,764	3,114	3,817	3,469
Fernbridge Jc. C.R. to Ferndale.					Soledad S. of Milk Plant.	3,766	3,195	3,616	3,429
S. on L.	3,564	2,318	3,746	2,402	San Lucas S. of Cy. at Jc. Rt. 10 to Coalinga and C.R. to Jolon.				
W. on C.R.	1,085	822	1,135	863	N. on 2.	2,771	2,313	2,732	2,510
N. on L.	3,498	2,359	3,666	2,491	E. on 10.	144	171	152	171
Eureka S. of Cy. Lts.	4,655	3,832	4,809	3,653	W. on C.R.	90	139	89	174
Eureka N. at Eureka Slough Bridge.	4,245	3,483	4,400	3,109	S. on 2.	2,664	2,248	2,628	2,339
Arcata N. of Cy. at Jc. Rt. 20 to Weaverville.					Paso Robles N. of Cy. Lts.	3,042	2,590	2,978	2,626
S. on L.	1,274	874	4,050	2,385	Paso Robles S. of Cy. Lts.	4,127	2,126	3,903	3,361
E. on 20.	1,388	954	1,438	688	San Luis Obispo N. of Cy. Lts.	3,919	2,993	4,235	3,853
N. on L.	293	114	2,554	1,744	San Luis Obispo S. of Cy. Lts. at R. B. King.	6,510	4,728	6,159	4,076
Arcata at Mad River Store.					Santa Maria N. of Cy. at Jc. Rt. 57 to Bakersfield.				
E. on L.	430	301			N. on 2.	4,619	3,141	4,771	3,473
S. on C.R.	2,702	1,832			E. on 57.	241	168	327	169
N. on L.	2,786	1,839			S. on 2.	4,624	3,223	4,835	3,233
Orick Jc. Rt. 1 and C.R. to Weitchpec.					1 Mi. S. of Zaca at Jc. Rt. 2 and Los Olivos Rd.				
S. on L.	1,648	941	1,256	1,074	E. on Los Olivos Rd.			3,076	2,653
E. on C.R.	77	49	81	64	S. on 2.			237	131
N. on L.	1,081	925	1,291	1,072	Buellton at Intersection with C. Rds. W. to Lompoc and Easterly.			2,972	2,615
Klamath River Br.	1,150	1,048	1,352	1,113	N. on 2.	3,397	2,430	2,259	2,563
Crescent Cy. S. E. of Cy. at Jc. Rd. to Crescent Cy.					E. on C.R.	481	367	721	434
S. on L.	1,745	1,942	1,579	1,541	W. on C.R.	537	348	458	347
N. to C. C.	2,374	2,433	2,123	2,064	S. on 2.	3,524	2,406	2,491	2,767
E. on L.	1,653	1,614	1,531	1,349	Gaviota W. of Road to Gaviota Sta.	3,308	2,381	3,289	2,563
Huachuca Bridge.					Orella, opposite Orella Sta.	3,996	2,752	3,450	2,608
E. on L.	662	509			Santa Barbara W. of Cy. at Jc. San Marcos Rd.	6,544	5,046	6,640	5,547
W. on L.	584	415			N. on 2.	945	380	1,220	411
C.R.	176	61			On San Marcos Rd.	6,870	5,250	7,449	5,764
Curve Half Way up Oregon Mt. N. Bound.	429				S. on 2.	8,411	6,821	8,638	7,462
1 3/4 Mi. S. Oregon Line S. Bound.	56	318			Santa Barbara W. of Cy. Lts.				
Oregon Line.	863	773	915	836	On 2.	12,755	10,539	12,286	10,186
					Santa Barbara 300 Ft. E. of Cy. Lts.	8,765	4,643	7,880	4,829
					S. R.-Ven. Co. Line.				
Route 2. San Francisco to San Diego (District IV)					Route 2. (District VII)				
Colma Jct. with C.R. to So. S. F. .					Ventura W. of Cy. at Br.	10,466	6,081	10,365	6,097
N. on 2.	28,553	14,883	26,442	11,314	Ventura E. of Cy. Lts.	11,667	7,552	10,382	6,711
E. on C.R.	4,535	2,337	3,832	1,952	El Rio Intersection.				
N. on 2.	24,018	11,746	22,620	9,361	W. on 2.	10,361	7,114	8,351	5,847
San Bruno Jc. with C.R. E. to So. S. F.					N. to Saticoy.	2,057	1,520	1,545	1,453
N. W. on 2.	23,843	11,468	22,722	9,132	S. to Oxnard.	9,322	5,342	7,870	5,239
					E. on 2.	5,297	2,845	4,700	2,830
					Ventura-L. A. Co. Line.	7,436	2,613	4,907	1,979

Station location	July, 1929		July, 1930		Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14		Sun. 14	Mon. 15	Sun. 13	Mon. 14
West of Hollywood-Ventura Blvd. at Sepulveda St.	12,036	5,592	10,208	5,486	Yreka S. Cy. Lts.	2,456	2,277	2,391	2,221
L. A. E. at Indiana St.	23,303	20,850	16,851	14,352	Cray N. of Cy. at Jc. with Rt. 46 via Klamath River.	1,590	1,320	1,636	1,382
Whittier at Jc. with Hadley St.	20,661	14,070	17,981	13,669	S. on 3.....	348	392	356	276
W. on 2.....	4,171	4,729	3,671	4,342	W. on 46.....	1,512	1,296	1,587	1,341
N. on 3 Hadley.....	16,513	10,493	12,644	10,045	N. on 2.....	1,599	1,351	1,615	1,308
E. on 2.....					Oregon Line.....				
La Habra E. Cy. Lts. at Jc. Rds. to La Habra and Brea.					Route 4. Sacramento to Los Angeles. (District X)				
N. on 2.....	11,534	5,456	9,050	4,701	Sacramento S. of Cy. Lts.	8,364	6,739	8,083	6,792
W. to La Habra.....	3,126	2,791	4,190	3,364	7 Mi. House at Intersection Florin Rd.	5,026	3,313	4,806	3,843
E. to Brea.....	3,075	2,670	3,053	2,198	N. on 4.....	821	680	948	872
S. on 2.....	5,856	10,314	5,469		W. on C.R.....	107	96	92	105
Anaheim N. of Cy. Lts.	15,074	10,112	13,947	9,465	S. on 4.....	4,655	2,992	4,563	3,418
Santa Ana N. of Cy. at Jc. C.R. to Orange.					Old Elk Grove at Intersection Franklin-Elk Grove Rd.	4,151	2,572	4,206	2,986
N. on 2.....	11,853	6,271	16,483	10,840	N. on 4.....	762	655	663	756
E. on C.R.....	7,473	6,095	9,354	6,810	W. on C.R.....	556	423	506	422
S. on 2.....	12,691	6,491	15,337	12,399	S. on 4.....	3,703	2,179	3,789	2,542
Tustin W. of Cy.	9,327	6,568	9,014	5,886	Twin Cities Jc. Rt. 34 to Jackson.	3,569	2,245	3,902	2,896
Serra at Jc. Ora-60-C with Ora- 2-A.					N. on 4.....	456	342	987	461
N. of Jc. on 2.....	6,582	3,588	5,167	2,550	E. on 24.....	3,667	2,304	3,926	2,848
S. E. of Jc. on 2.....	10,380	4,938	10,396	5,987	Jc. State Highway & C.R. to Forrest Lake.			3,759	2,394
W. of Jc. on 60.....	7,188	3,318	7,517	3,902	N. on 4.....			437	266
Oceanside Mr. S. Cy. Lts.	9,666	5,838	9,297	5,419	S. W. on C.R.....			3,325	2,202
Del Mar at S. F. R. Xing.	9,456	4,721	9,053	4,676	S. on 4.....				
Route 3. Sacramento to Oregon Line. (District III)					Lodi Jc. Rt. 24 to San Andreas.	3,875	3,068	3,573	3,213
Sacramento N. at Jc. Garden Highway, S. on 3.....	*8,501	5,663	13,105	13,485	N. on 4.....	1,725	1,283	1,542	1,536
On Garden Highway.....	2,210	1,494	1,943	1,832	W. on C.R.....	5,002	3,667	4,080	3,737
N. on 3.....	*6,564	6,171	13,261	12,223	Stockton N. of Cy. at Cherokee Sta.			3,811	2,387
Ben Ali Xing Jc. C.R.					N. E. on 4.....	3,568	2,278		
W. on C.R.....	*2,578	1,478	7,600	5,023	S. E. on C.R.....	434	260		
E. on C.R.....	282	164	602	452	Jc. of Mariposa Rd. S. of Stock- ton.			3,107	2,234
N. on 3.....	*2,887	1,886	1,088	988	S. on 4.....	1,938	1,517	2,363	1,794
C. R. to Folsom N. of 12 Mi. House.	*	*	7,427	4,672	E. on Mpa. Rd.	1,132	721	1,178	746
S. on 3.....	*2,466	1,423	6,335	4,032	French Camp Jc. Rt. 5 to Oak- land.			3,447	2,488
E. on C.R.....	435	197	724	397	N. on 4.....	2,707	1,942	4,056	2,921
N. on 3.....	*1,846	1,283	5,686	3,655	S. E. on 4.....	812	626	3,291	2,456
Roseville S. of Cy. at N. end of Guard Rail Lane.	5,395	3,548	6,626	4,552	Intrix McKinley Ave. and C.R. with old SJ-4-B.	3,522	1,991		
Roseville, N. of Cy. Lts.	1,715	1,173	1,857	1,500	On old SJ-4-B.....	1,851	1,495		
Marysville S. of Cy. at Jc. Ham- mington Road.					Interr. Rt. 4 and C.R. at Turner Sta.			2,228	1,715
S. on 3.....	1,535	1,272	1,574	1,901	N. on 4.....			3,112	2,444
Hm. Rd.	627	613	705	977	S. on 4.....			1,589	1,271
N. on 3.....	2,473	2,229	2,691	3,594	W. on C.R.....	5,562	4,021	5,704	4,905
W. on C.R.....	466	460	860	1,080	Ripon N. of City.....	5,285	3,903	6,077	4,392
Yuba City N. of Cy. at Jc. Rt. 15.					N. on 4.....	421	404	385	414
S. on 3.....	3,623	3,411	3,932	4,415	S. on 4.....	5,302	3,966	6,141	4,503
W. on 15.....	1,096	1,938	2,228	2,521	Modesto N. of Cy. Jc. Crows Landing Road.	7,282	6,212	7,777	6,702
N. on 3.....	2,269	2,160	2,693	2,829	N. on 4.....	9,576	2,535	10,543	9,267
Richvale Wye Jc. Rt. 21 to Oro- ville.					S. on 4.....	7,178	6,211	9,598	8,544
S. on 3.....	1,290	977	1,339	1,147	W. on C.R.....	2,556	2,367	3,086	2,933
W. on 3.....	1,157	886	1,261	1,057	Turlock N. of City.....	5,845	4,751	6,043	5,119
E. on 21.....	449	358	486	459	Turlock S. of City.....	4,579	3,791	5,298	4,379
Chico at Jc. C.R. E. to De Sabla.					Route 4. (District VI)				
S. on 3.....	2,945	2,498	3,064	2,771	Stanislaus-Merced Co. Line.	4,134	3,531	4,319	3,356
E. on C.R.....	337	319	378	366	Atwater N. of City.....	4,173	3,251	4,501	3,873
N. on 3.....	3,151	2,709	3,342	2,969	Merced N. Cy. Lts. at Br.	5,782	4,956	6,428	5,475
Chico N. of Cy. at Jc. C.R. East.					Merced S. Cy. Lts. at Br.	4,219	4,093	4,382	3,816
S. on 3.....	2,151	2,014	2,433	2,317	Merced-Madera Co. Line.	3,684	2,213	3,094	2,431
E. on C.R.....	433	255	515	349	Califa Jc. Rt. 32 to Gilroy.				
N. on 3.....	1,809	1,818	2,069	2,108	N. on 4.....	3,251	2,358	3,398	2,333
Route 3. (District II)					W. on 32.....	1,142	818	618	716
Butte-Tehama Co. Line.	1,657	973	1,050	941	S. on 4.....	3,095	3,333	2,914	
Bed Bluff E. at Jc. with Rt. 29 to Susanville.					Madera N. of City.....	3,251	3,715	4,548	3,528
S. on 3.....	1,439	1,285	1,868	1,720	Madera-Fresno Co. Line.	5,029	3,744	4,813	4,020
E. on 29.....	849	573	987	820	Muscatel	5,529	4,068	6,201	4,248
N. on 3.....	1,847	1,579	2,051	1,959	Fresno N. of Cy. N. of S. P. R. R. Xing at Jc. Olive Ave.			7,410	5,221
Cottonwood at Jc. Te- hama-Shasta Co. Line.	2,363	2,144	2,117	1,812	N. on 4.....	7,410	5,221	7,467	5,746
Redding S. of Cy. at Jc. with Rt. 28 to Alturas.					E. on 4.....	2,461	1,064	2,681	1,311
S. on 3.....	2,225	2,217	2,144	2,283	N. on 4.....	5,874	5,460	5,981	5,069
E. on 28.....	665	654	723	758	W. on Olive.....	1,400	854	2,790	1,151
N. on 3.....	2,721	2,749	2,713	2,916	Fresno S. of Cy. at Jc. Church Ave. On 4.....	9,493	8,507	9,938	9,285
Redding 3 Mi. N. at Jc. with C.R. to Kennett.									
S. on 3.....		1,549	1,250						
W. on C.R.....		36	43						
N. on 3.....		1,542	1,257						
Gibson.....	1,510	1,323	1,342	1,342					
Dunsuir 1.5 M. S.	2,302	1,983	2,107	1,785					
Dunsuir J. M. Cy. Lts. at Br.	4,603	2,376	4,060	3,526					
Dunsuir 4 Mi. N. at Mott.	2,794	1,972	2,728	2,001					
Gazelle 1 Mi. North.....	1,716	1,538	1,447	1,242					

*Construction under way Ben Ali to Sylvan Corner.

Route 7. (District II)

Station location	July, 1929		July, 1930		Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Red Bluff S. of town at Read Cr. Br.-----	1,929	1,769	1,714	1,578	Visalia Wye Jc. Rt. 4 W. to Goshen & S. to Bakersfield and Rt. 10 E. to Visalia, W. on 4-----	2,012	2,607	2,810	2,664
Route 8. Ignacio to Cordelia via Napa. (District IV)					S. on C.R.-----	2,316	1,619	2,616	2,925
Petaluma C. Bridge-----	3,261	856	3,349	1,167	E. on 10-----	4,545	3,874	4,785	4,435
Schellville Jc. Rt. 51 to Santa Rosa,-----					Visalia E. of Cy. at Exeter Jct., W. on 10-----	2,327	2,068	2,411	2,231
S. on 8-----	2,077	1,315	3,777	1,248	S. to Exeter-----	1,224	1,175	1,266	1,172
N. on 51-----	3,266	1,012	2,455	845	E. on 10-----	1,590	1,082	1,676	1,469
N. E. on 8-----	1,774	538	1,923	758	Lemon Cove Jc. C.R. to Wood-lake,-----				
Vineburg Jc. Rt. 8 with C.R. to Vineburg,-----					W. on 10-----	1,627	798	1,669	834
W. on 8-----			1,988	664	N. on C.R.-----	1,032	371	1,116	474
E. on 8-----			4,653	1,701	E. on 10-----	2,127	893	2,220	872
N. on C.R.-----			2,860	1,149	Three Rivers E. of town at Jc. C.R. northerly,-----				
Napa Junction Jc. C.R. to Val-lejo,-----					W. on 10-----	1,298	574	1,413	621
N. on 8-----	7,049	3,029	8,590	3,695	N. on C.R.-----	182	82	298	96
S. on C.R.-----	6,989	3,007	10,436	5,161	E. on 10-----	3,161	575	1,389	626
E. on 8-----	*633	*382	6,158	3,784					

Route 8. (District X)

New Jc. Routes 7 and 8 at Cor-delia,-----					Route 11. Sacramento to Nevada Line via Placerville. (District III)				
S. on 7-----	*3,434	*2,089	428	337	Sacramento E. of Cy. Lts-----	5,926	2,885	5,079	3,111
W. on 8-----	*584	*877	5,099	3,074	Perkins Jc. with C.R. to Ply-mouth,-----				
E. on 7-----	*2,442	*2,377	5,285	3,353	W. on 11-----	2,444	1,464	5,105	3,065

Route 9. San Fernando to San Bernardino. (District VII)

Tujunga west of Sunset Blvd.,-----	5,436	3,214	5,329	3,566	S. E. on C.R.-----	1,332	857	1,495	1,122
La Crescenta W. of Penn Ave.,-----	6,096	3,459	5,916	4,047	E. on 11-----	2,658	1,247	3,981	1,963
La Canada at School St.,-----	6,633	3,385	5,425	4,728	Folsom W. of Cy. Jc. Pratt Rd., W. on 11-----	1,907	977	2,676	1,525
Pasadena E. of Cy. Lts.,-----	12,214	7,793	11,072	7,645	E. on C.R.-----	488	267	737	382
Azusa W. City Limits,-----	10,708	5,784	11,494	6,981	E. on 11-----	1,792	868	2,003	1,242

Route 9. (District VIII)

S. Bd.-L. A. Co. Line-----	Not taken acct. const.	8,124	3,259		Folsom E. of Town at High School,-----				
Upland F. of Cy. at Jc. C.R. to Upland,-----					N. on 11-----	967	406	1,406	762
W. on 9-----	Not taken acct. const.	5,501	2,457		E. on 11-----	741	386	1,859	966
S. W. on C.R.-----	Not taken acct. const.	1,863	1,690		W. on C.R.-----	227	110	555	235
E. on 9-----	Not taken acct. const.	7,493	3,967		El Dorado Jc. Rt. 65,-----				
Upland at Euclid Ave. interx.,-----					W. on 11-----	1,422	709	1,604	658
W. on 9-----	Not taken acct. const.	7,296	3,417		S. on 65-----	336	179	342	181
N. on Eu. Ave.,-----	Not taken acct. const.	3,414	1,971		E. on 11-----	1,935	620	1,164	558
S. on Eu. Ave.,-----	Not taken acct. const.	3,081	2,413		Placerville W. of City,-----	2,823	1,433	2,432	1,687
E. on 9-----	Not taken acct. const.	5,728	2,817		Placerville E. of City,-----	2,435	1,395	2,495	1,438
S. Bd. W. of Cy.,-----	Not taken acct. const.	7,358	5,587		Hidra Camp 14 Mi. Post,-----			1,817	750

Route 10. San Lucas to Sequia National Park. (District V)

San Lucas S. of City at Jc. Rt. 2-----	144	171	152	171	Between Riverton and Kyburz., Alpine Jct.,-----	1,549	779	1,447	606
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Route 10. (District VI)

Monterey-Fresno Co. Line-----	148	72	128	69	W. on 11-----	637	359	547	296
Parkfield Jc.,-----					N. on 23-----	117	93	100	82
W. on 10-----	289	112	242	117	E. on 11-----	625	366	573	300
N. on C.R.-----	137	46	94	29	Jc. Rt. 38 to 11 Lake Tahoe,-----				
E. on 10-----	212	149	292	122	S. on 38-----	713	411	690	390
Coalinga S. of City,-----	690	568	560	455	N. on 11-----	497	293	687	412
Oilfields at Oil King School,-----					E. on 11-----	183	147	624	381
W. on 10-----	1,167	1,260	357	366	Lakeside at State Line,-----	749	597	937	628
N. on C.R.-----	236	280	188	212					
E. on 10-----	925	982	320	391					

Route 10. (District VII)

Coalinga 3 Mi. E. at Jc. C.R. to Oilfields,-----					San Diego E. of Cy. Euclid Ave. at Canon Ave.,-----	7,120	4,445	8,193	5,287
W. on 10-----	726	789	794	793	El Cajon W. of Cy. Lts.,-----	5,124	3,812	5,333	4,857
N. on C.R.-----	479	446	167	145	At Sweetwater Bridge,-----	2,053	1,362	1,949	902
E. on 10-----	473	520	627	648	Jacumba at Jc. C.R. to El Campo,-----				
Kings River Bridge,-----	469	451	273	286	W. on 12-----	1,388	746	1,595	796

Route 10. (District VIII)

Lemoore Jc. C.R. to Lemoore,-----					S. on C.R.-----	533	298	701	191
N. on 10-----	607	597	549	477	E. on 12-----	1,814	940	2,103	907
E. on C.R.-----	560	560	447	445					
S. on 10-----	651	607	404	342	On Imp-12-B,-----	1,288	727	1,911	984
Hanford W. of Cy. Lts.,-----	1,919	2,084	1,591	1,942	El Centro W. of Cy. at Jc. Rt. 26 to S. Bd.,-----				
Hanford E. of Cy. at Interx. Co. Rds. N. to Kingsburg & S. to Corcoran,-----					W. on 12-----	2,843	2,774	2,556	2,789
W. on 10-----	3,621	2,949	3,371	3,339	N. on 23-----	3,299	3,600	3,873	4,097
N. on C.R.-----	2,103	1,666	2,014	1,894	E. on Mulberry Lane,-----	2,191	2,353	2,376	2,619
E. on 10-----	2,553	2,244	2,566	2,657	S. from Interx.,-----	4,040	4,117	4,768	4,598
S. on C.R.-----	1,807	1,512	2,010	1,847					

Route 13. Salida to Rt. 23 at Junction. (District X)

Goshen Jct. Jc. Rt. 4 N. to Fresno E. to Visalia & S. to Tulare,-----					Salida Jc. Rt. 4, E. of Jc.,-----	421	404	385	414
W. on 10-----	1,665	1,062	1,512	1,184	E. of Salida at McHenry's Jc. C.R. to Modesto,-----				
N. on 4-----	3,340	2,665	3,320	2,925	W. on 13-----	580	459	590	563
S. on 4-----	3,243	2,478	3,038	2,554	S. on C.R.-----	2,117	1,572	2,446	1,895
E. on 4-----	2,087	1,563	1,956	1,807	E. on 13-----	2,166	1,581	2,443	1,797
					Oakdale W. of City,-----	1,742	1,259	1,663	1,368
					Oakdale E. of City,-----			2,300	1,256
					Mountain Pass J. Rt. 40 to Yosemite,-----				
					S. W. on 13-----	1,204	632	1,634	657
					S. E. on 40-----	819	220	340	182
					N. E. on 13-----	1,356	536	1,365	551
					Sonora S. of City,-----	2,454	1,618	2,891	1,734
					Sonora E. of City,-----	1,884	1,071		
					E. end of Sullivan Cr. Br.,-----				
					E. on Br.,-----	820	619	939	679
					N. E. on 13-----	1,086	473	1,428	624
					W. over Br.,-----	1,884	1,071	2,223	1,269

*Construction under way from Junction to Greenwood Corner.

Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14
Jct. St. Highway & Rd. to Pine Cr.				
E. on 13.....	660	347	409	300
W. on 13.....	540	273	638	329
S. E. on C.R.	914	390	590	294
Jct. St. Highway & C.R. at "Pokeys"				
W. on 13.....	1,612	578	1,283	611
E. on 13.....	1,961	672	1,443	652
S. on C.R.	434	171	269	128

Route 13. (District IX)

Jc. Rt. 23.....	37	35	68	70
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Route 14. Albany to Martinez. (District IV)

Albany at Co. Line.....	26,028	15,892	26,762	15,410
Jc. C.R. to Richmond,				
S. on 14.....	25,420	14,668	25,952	16,163
W. on C.R.	8,631	5,378	8,479	5,776
N. on 14.....	16,934	8,848	18,132	10,459
Jc. Franklin Canyon Rd.,				
S. on 14.....	11,276	5,192	12,953	6,261
E. on C.R.	2,460	1,295	3,289	1,546
N. on 14.....	9,136	4,273	10,416	5,070
Carquinez Straits Bridge,	7,260	3,244	7,383	3,731
Crockett 1 Mi. S. of City at Jc. C.R. to Crockett,				
S. on 14.....	2,107	1,529	2,376	1,608
W. on C.R.	1,152	1,258	1,142	1,437
N. on 14.....	1,898	1,315	2,159	1,467
Martinez W. City Lts.	1,127	542	1,416	663

Route 15. Rt. 1 near Calpella to Rt. 37 near Cisco. (District IV)

Ukiah N. at Jc. Rt. 1.....	1,019	749	1,112	862
Upper Lake S. of Cy. Jc. C.R. to Lakeport,				
W. on 15.....	1,198	1,181	1,051	974
S. on C.R.	763	566	586	608
N. on 15.....	927	894	1,206	1,316
Upper Lake Jc. C.R. to Bartlett Spgs.,				
W. on 15.....	404	349	335	158
E. on C.R.	59	34	36	20
S. on 15.....	377	329	340	151

Route 15. (District III)

Hog Hollow Jc. Rtes. 49 & 15,				
E. on 15.....	266	354	654	199
S. on 49.....	272	217	654	317
N. on 15.....	379	443	284	353
Near Venada Jc. C.R. to Bartlett Spgs.,				
S. on 15.....	103	97	218	147
W. on C.R.	72	66	85	50
E. on 15.....	215	150	292	167
Williams W. of City.....	655	551	688	695
Williams E. of City.....	553	477	595	553
Colusa E. of City.....	900	760	1,125	979
Sutter City,				
W. on 15.....	895	624	1,021	813
N. on C.R.	309	217	365	317
E. on C.R.	366	456	364	497
S. on 15.....	1,045	806	1,139	1,075
Marysville E. of City.....	1,031	656	1,262	814
Smartsville E. of City,				
N. on 15.....	351	126	342	147
W. on 15.....	362	120	346	152
N. on C.R.	85	52	71	40
Grass Valley W. of City.....	727	410	775	528
Nevada City E. of Cy.,				
E. on 15.....	427	347	449	394
Emigrant Gap, Jc. Rtes. 37 & 15	78	79	90	32

Route 16. Hopland to Lakeport (District IV)

Hopland at Jc. Rt. 1.....	711	787	934	793
Lakeport S. of town at Jc. C.R. to Kelseyville,				
N. E. on 16.....	1,498	1,266	1,418	1,311
S. on C.R.	960	922	863	958
W. on 16.....	478	314	555	387

Route 17. Roseville to Nevada City (District III)

Roseville E. of City.....	3,601	2,193	4,639	2,672
Auburn W. of Cy. Jc. Ophir Road & Wise P. H.,				
E. on 17.....	1,955	1,868	1,966	1,313
W. on 17.....	2,277	1,977	2,147	1,419
N. on C.R.	312	296	330	291
Auburn S. of City at S P. Xing	1,955	1,868	-----	-----
Auburn N. of Cy.,				
S. on 17.....	657	375	764	476
E. on C.R.	54	67	147	104
N. on 17.....	623	386	616	408

Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14
Grass Valley S. of City.....	1,282	631	1,260	688
Nevada City S. of City.....	1,969	1,309	1,726	1,187

Route 18. Merced to Rt. 40 near Sequia. (District VI)

Merced 1.6 Mi. E. at Interx. C.R. & 21st St.,				
W. on 18.....	2,598	2,368	2,364	2,661
E. on 18.....	2,661	2,416	2,798	2,727
N. on C.R.	1,469	1,419	2,118	2,052
Merced 12 Mi. E. at Interx C.R. to Le Grand,				
W. on 18.....	1,848	1,296	1,770	1,145
S. on C.R.	107	69	96	58
E. on 18.....	1,877	1,284	1,789	1,181
Mormon Bar at Interx with C.R. to Mormon Bar,				
S. on 18.....	2,239	1,435	2,026	1,162
E. on C.R.	368	254	254	176
N. on 18.....	2,026	1,328	1,986	1,204
Riesburg at Bear Cr. Br. on 18 El Portal, Jct. C.R. to El Portal,				
W. on 18.....	1,850	1,211	1,826	1,052
E. on 18.....	1,819	1,257	1,743	1,066
W. on C.R.	381	387	411	299

Route 19. From Rt. 9 West of Claremont to Riverside (District VIII)

Bet. Pomona and Ontario at Chino Cross Roads (old road),				
W. on 19.....	10,674	6,650	9,682	6,665
N. on C.R.	98	147	327	633
S. on C.R. to Chino.....	290	308	1,071	1,215
E. on 19.....	10,546	6,828	8,998	6,737
Bet. Pomona & Ontario at Chino Cross Roads (new highway),				
N. on C.R.	-----	-----	1,190	1,124
N. on C.R.	-----	-----	1,618	1,495
E. on 19.....	-----	-----	3,653	2,868
W. on 19.....	-----	-----	3,173	2,692
L. A. Co. Line E. Lts. Pomona (old rd.).....	11,733	7,516	9,515	6,926
L. A. Co. Line E. Lts. Pomona (new rd.).....	2,534	2,159	3,837	3,173
East of Ontario E. Cy. Lts. at Jc. new S. Rd.-19-B with old road,				
N. W. on old 19.....	4,645	3,654	2,534	1,692
W. on new old 19.....	1,090	691	1,738	1,147
S. E. on 19 (old road).....	-----	-----	4,109	2,594
Ontario Cy. Lts., N. W. on 19.,	3,873	2,274	-----	-----
At S.Bd.-Riv. Co. Line.....	4,355	2,673	3,649	2,103
Wineville E. of City.....	4,312	2,421	4,269	2,712
Riverside W. of Cy. Lts. near Santa Ana River Br.	13,305	5,098	6,417	5,387

Route 20. Rt. 1 near Arcata to Redding via Weaverville. (District I)

Arcata N. of Cy. at Jc. Rt. 1.....	1,388	954	1,438	688
Willow Creek Jc. C.R. to Hoopa,				
W. on 20.....	127	82	176	128
N. on C.R.	135	76	188	122
E. on 20.....	169	87	187	121
Humboldt-Trinity Co. Line.....	186	86	337	260

Route 20. (District II)

Big Bar vicinity.....	88	79	96	90
Weaverville 3 Mi. south.....	184	207	296	185
Bet. Redding and Tower House	259	415	288	220

Route 21. Rt. 3 Nr. Richvale to Quincy (District III)

Richvale Wye.....	449	358	486	459
Oroville W. of Cy. at Jc. Marysville Rd.,				
N. on 21.....	1,790	1,722	1,124	1,223
W. on 21.....	1,067	1,026	1,999	1,821
S. on C.R.	827	598	963	712
Oroville E. of Cy., Ridge Road	1,510	1,142	1,966	1,508
Miners Ranch, N. on 21.....	837	245	867	403
S. on C.R.	252	134	329	266
W. on 21.....	1,068	362	1,009	576
Bidwell Bar Br.	509	623	278	-----
Berry Creek.....	329	141	327	174
Meadow Valley,				
W. on 21.....	147	128	164	147
N. on C.R.	100	114	125	121
E. on 21.....	179	141	173	158
Quincy.....	552	366	443	336
Oroville E. of Cy., River Road	-----	-----	286	298

Route 22. San Juan Bautista to Rt. 32 via Hollister (District V)

San Juan Bautista S. of City at Jc. Rt. 2.....	3,001	1,780	3,381	2,113
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Route 22. (District IV)

Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14
Hollister Jc., Jr. Rt. 32.....	1,065	699	1,121	735

Route 23. Saugus to Rt. 11 at Alpine Jc. (District VII)				
Saugus Jc. with Rt. 1.....	3,806	2,402	3,298	1,628
Palmdale S. of Cy. Lts.....	2,111	1,374	2,133	1,490
Lancaster Jc. with Rt. 59 to				
Nearach, S. on 23.....	1,913	1,542	1,923	1,715
W. on 59.....	690	584	758	830
N. on 23.....	1,361	982	1,334	1,106
L. A.-Kern Co. Line.....	889	549	827	623

Route 23. (District IX)

Mojave Jc. Rtes. 58 and 23.....	821	569	894	566
S. on 23.....	131	90	146	114
N. on 23.....	624	911	892	618
Mojave Jc. C.R. to Bakersfield.....				
S. on 23.....	778	619	814	611
N. W. on C.R.....	393	292	293	226
N. on 23.....	478	363	524	391
Fireman 1 Mi. N. Jc. to Rt. 57.....				
S. on 23.....	415	314	256	200
W. on 57.....	87	62	80	76
N. on 23.....	334	439	236	223
Kern-Inyo Co. Line.....	435	305	-----	-----
Olancha Jc. C.R. to Keeler.....				
S. on 23.....	524	347	564	484
E. on C.R.....	26	28	36	48
N. on 23.....	520	347	577	475
Lone Pine S. Cy. Lts. Jc. C.R. to Keeler.....				
S. on 23.....	707	606	701	525
E. on C.R.....	106	109	164	130
N. on 23.....	759	657	847	633
Big Pine Jc. Rt. 63 to Oasis.....				
S. on 23.....	855	586	829	580
E. on 63.....	67	70	99	110
N. on 23.....	817	554	822	593
Bishop half Mi. N. at Jc. C.R. N. to Laws & Dirt Rd. Easterly.....				
S. on 23.....	1,314	1,088	1,239	1,123
N. on C.R.....	324	368	319	402
E. on C.R.....	22	21	65	45
W. on 23.....	997	732	941	751
Mono-Inyo Co. Line.....	652	397	710	515
Farrington Ranch.....				
N. on 23.....	-----	-----	326	286
S. on 23.....	-----	-----	251	200
Leeringing Jc. Rtes. 10 & 23.....				
On 49.....	268	197	281	269
Mono 23-L.....	379	387	378	368
On 23-L.....	341	307	274	305
Bridgeport at E. Cy. Lts.....	327	365	354	359
On Mono 23-K.....	177	122	257	269
Sonora Jc., Jr. Rtes. 13 & 23.....				
S. on 23.....	174	190	113	122
W. on 13.....	37	35	68	70
N. on 23.....	170	210	110	151

Route 23. (District X)

S. of Markleeville Jc. Rt. 24.....				
On 23.....	60	50	65	43
On 24.....	41	37	65	43
Jc. St. Hy. & C.R. at Wood-fords.....				
S. E. on 23.....	62	25	194	55
N. E. on C.R. to Minden.....	169	50	250	48
X. W. on 23.....	72	25	293	59
Picketts Jc., Jr. Rt. 34.....				
E. on 23.....	86	63	268	92
W. on 34.....	90	26	184	79
N. W. on 23.....	78	38	183	90
Jc. Rt. 11.....	117	93	160	82

Route 24. Route 4 near Lodi to Route 23 near Silver Creek.

(District X)				
Lodi Jc. Rt. 4.....			1,542	1,536
Jc. Rt. 24 & C.R. to Lone.....				
W. on 24.....	1,892	844	2,055	1,006
N. on C.R.....	1,024	392	1,091	541
E. on 24.....	1,024	555	1,159	376
Bet. San Andreas and Valley Srgs.....	897	385	1,045	410
Jc. Rt. 24 and C.R. to Valiente.....				
E. on 24.....	653	285	690	284
S. on C.R.....	175	117	292	97
W. on 24.....	641	298	693	288
Jc. Rt. 24 & C.R. to Murphys.....				
S. on 24.....	654	289	746	296
N. on C.R.....	485	292	654	332
E. on 24.....	852	377	1,033	391

Route 25. Nevada City to Downieville. (District III)

Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14
Nevada Cy. N. of Cy.....	418	225	478	335
Comptonville N. of Cy.....	293	151	278	228
Downieville Jc. Rtes. 25 & 36.....				
W. on 25.....	251	146	293	239
N. on 36.....	10	7	5	3
E. on 25.....	261	149	295	246

Route 26. San Bernardino to El Centro. (District VIII)

San Bdo. S. of Cy. at N. end of Santa Ana River Br.....				
N. on 26.....	-----	-----	2,471	2,559
W. on C.R.....	-----	-----	2,835	2,072
S. on 26.....	-----	-----	4,596	4,061
Bet. S. Bdo. & Redlands at Jc. of Hunt's Lane.....				
S. on C.R.....	-----	-----	566	475
E. on 26.....	-----	-----	4,681	3,992
W. on 26.....	-----	-----	4,719	4,141
Jc. Road to Colton at Interx with Mt. View Ave. W. of Redlands.....				
E. on 26.....	4,741	3,344	4,236	3,462
S. on C.R.....	962	707	779	839
N. on C.R.....	1,661	1,549	924	921
W. on 26.....	4,248	2,806	4,392	3,550
Colton Ave. at W. Cy. Lts. of Redlands.....	-----	-----	4,754	4,399
S.E. of Redlands Jc. C.R. to Yucaipa.....				
N.W. on 26.....	2,773	2,115	2,701	2,505
S. on C.R.....	588	535	562	613
S. E. on 26.....	2,224	1,634	2,170	1,896
At S. Bdo. Riv. Co. Line.....	2,386	1,756	2,396	1,979
Beaumont Jc. Jack Rabbit Trail.....	2,226	1,390	1,942	1,661
W. on Jack Rabbit Trail.....	1,147	676	1,042	652
E. on 26.....	3,051	1,945	2,632	2,097
Banning W. of Cy.....	2,637	1,913	2,956	2,257
At Jc. C.R. to Palm Springs.....				
E. on 26.....	1,115	925	1,318	1,148
S. E. to Palm Springs.....	243	184	258	189
W. on 26.....	1,394	1,046	1,469	1,317
One Mi. S. of Indio at Jc. of C.R. S. to Coachella.....				
N. on 26.....	-----	-----	1,076	2,036
S. W. on 26.....	-----	-----	1,109	988
S. on C.R.....	-----	-----	915	1,126
Coachella S. of Cy. at Jc. C.R. to Thermal & Mecca.....				
N. on 26.....	1,088	1,059	1,382	1,353
E. on C.R.....	538	547	272	244
W. on C.R.....	185	183	223	223
S. on 26.....	777	701	1,242	1,092
At Riv.-Imp. Co. Line.....	861	766	681	622
Westmoreland, 5 Mi. W.....	-----	-----	830	862
Westmoreland, at R. R. Xing.....	1,586	1,777	1,703	1,659
Brawley at W. Cy. Lts. Jc. with Western Ave.....				
W. on 26.....	2,356	2,596	2,311	2,505
N. on Cy. St.....	130	118	241	243
E. on Cy. St.....	2,339	2,569	2,361	2,412
S. on Cy. St.....	167	141	441	436
Brawley Jc. S.W. of Cy.....				
N. on 26.....	2,591	2,656	2,930	3,018
E. on Cy. St.....	2,456	2,642	2,619	2,674
N. W. on C.R.....	140	125	388	441
El Centro W. of Cy. Jc. Rt. 12.....	3,299	3,600	3,873	4,097

Route 27. El Centro to Yuma. (District VIII)

El Centro E. of Cy. at Jc. C.R. N. to Brawley and S. to Calexico.....				
W. on 27.....	2,671	3,082	3,636	3,226
N. on C.R.....	140	194	240	226
S. on C.R.....	152	185	292	233
E. on 27.....	2,669	3,014	2,585	3,110
E. of Holtrille.....	1,616	1,621	1,896	1,905
Sand Hills Maint. Sta.....	694	451	585	488
Yuma at S.D.A. Plant Quarantine Station.....	2,461	1,765	2,293	1,887

Route 28. Redding to Nevada Line via Alturas. (District II)

Redding S. of Cy. at Jc. with Rt. 3.	665	654	723	756
Montgomery Creek.....	311	300	189	291
4 Mi. E. of Pittville at Maint. Sta.	182	122	167	153
Canby.....	279	244	268	253
5 Mi. N. Alturas at Jc. with Lakeview Rd.				
S. on 28.....	388	236	322	222
N. on C.R.....	205	138	172	125
E. on 28.....	219	121	168	109
2 Mi. E. of Cedarville.....	121	88	141	51

Route 29. Red Bluff to Nevada Line Near Purdy's. (District II)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Red Bluff E. at Jc. Rt. 3.....		849	573	987	820
Teh.-Plu. Co. Line.....		468	293	528	349
2 Mi. W. of Westwood.....		1,272	720	947	628
Susansville 1 Mi. W. of town.....		1,206	662	855	570
Susansville 1 Mi. E. of town.....		1,589	1,362	1,719	1,524
12 Mi. E. of Milford at Maint. Sta.....		203	191	288	220
5 Mi. S. of Constantia at Maint. Sta.....		440	308	289	242

Route 31. San Bernardino to Nevada Line near Jean. (District VIII)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
S. Rd. N. of Cy. at Jc. with Mt. Vernon and Highland Ave.....		2,968	2,922	3,728	2,572
S. on Mt. Vernon.....		3,554	1,828	3,680	2,010
E. on Highland.....		2,487	1,294	2,791	* 102
W. on Highland.....		1,599	1,165	1,699	1,721
Jc. Route 31 with State St.....		2,061	1,158	2,276	1,222
N. W. on 31.....		710	285	820	355
S. on State.....		1,420	1,090	1,689	1,090
Verdemont Jc. Rt. 31 and Kendall Dr.....		2,757	1,706	2,670	1,504
N. on 31.....		2,216	1,142	2,124	1,134
S. on K. Drive.....		992	724	698	516
N. of Cajon Jc. C.R. to Swartout Valley.....		2,331	1,433	2,299	1,029
S. on 31.....		788	177	925	254
W. on C.R.....		1,541	1,161	1,416	1,254
N. on 31.....		1,865	1,455	1,461	1,251
Victorville S. Cy. Lts.....		901	811	926	766
Helendale.....		434	932	937	847
S. town lts. of Bar-tow.....		486	477	416	334
Yermo, E. of Cy. Lts.....		311	301	306	374
Baker.....		277	259	324	308
Nevada State Line.....					

Route 32. Route 2 near Gilroy to Route 4 near Califa (District IV)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Hollister Jc. with Rt. 22.....		991	724	1,110	683
W. on 22.....		1,065	699	1,121	735
S. on 22.....		1,639	1,291	1,913	1,233
E. on 22.....					
Pacheco Pass at Santa Clara- Merced Co. Line.....		1,783	1,042	1,601	1,130

Route 32. (District VI)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Junction-Jc. C.R. to Gustine.....		1,782	1,099	1,144	1,878
W. on 32.....		485	252	470	253
N. on C.R.....		1,522	905	1,305	972
E. on 32.....					
Los Banos S.F. R.R. Xing near Maint. Yard.....		2,535	2,373	2,884	2,611
E. of Los Banos at Jc. C.R. to Dos Palos.....		2,224	1,808	2,401	1,929
S. on C.R.....		910	852	1,077	1,013
E. on 32.....		2,145	1,530	2,400	1,713
Merced-Madera Co. Line at Jc. C.R.....					
W. on 32.....		1,895	1,153	1,886	1,205
N. on C.R.....		701	528	718	518
E. on 32.....		1,287	778	1,347	816
Califa Jc. Rt. 4.....		1,142	818	618	716

Route 33. Paso Robles to Route 4 near Bakersfield. (District V)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Paso Robles E. of Cy. Lts.....		1,184	1,232	1,337	1,386
Paso Robles Quarter Mi. E. of Cy. Lts., on 33.....		1,617	944	1,040	997

Route 33. (District VI)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
S. L. O.-Ker. Co. Line.....		483	260	432	246
Blackwell's Cor. Jc. C.R. to Coalinga and S. to Taft.....					
W. on 33.....		408	334	340	199
N. on C.R.....		162	263	115	127
S. on C.R.....		180	257	171	127
E. on 33.....		400	379	282	207
Lost Hills Interx. of Main St.....		605	642	492	445
W. on 33.....		31	34	13	16
S. on Main.....		128	139	161	128
E. on 33.....		605	603	492	458
Wasco Jc. C.R. S. to Wasco near S.F. R.R. Xing.....		632	586	784	715
W. on 33.....		767	778	847	897
S. on C.R.....		824	712	815	651
Famosa Jc. Rt. 4.....		670	524	574	438

Route 34. Route 4 near Arno to Route 23 at Picketts Jc. (District X)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Twin Cities Jc. Rt. 4.....		456	342	987	461
W. of Lons Jc. C.R. to Michigan Far.....					
W. on 34.....		179	92	106	71
N. on C.R.....		156	132	72	54
E. on 34.....		205	237	126	92
W. of Jackson Jc. Rt. 63 to Placerville.....					
E. on 34.....		1,262	956	1,282	1,280
N. on 65.....		875	815	876	963
W. on 34.....		503	351	592	436
Pine Grove at Jc. C.R.....					
S. W. on 34.....				404	267
N. W. on C.R.....				367	232
E. on 34.....				769	474
Pine Grove E. of town.....		595	234		
Jc. St. Highway & P.G.&E. Forest Rd. at Ranger Sta.....					
E. on 34.....				372	85
S. on C.R.....				48	53
W. on 24.....				399	136
Jc. St. Highway & C.R. to Sil- ver Lake.....					
E. on 34.....				255	88
S. on C.R.....				193	59
W. on 34.....				320	81
Picketts Jc. Rt. 23, on 34.....		90	26	184	79

Route 35. Peanut to Kuntz. (District I)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
At Peanut.....		72	48		
Forest Glenn.....				44	38

Route 37. Auburn to Truckee. (District III)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Auburn E. of City.....		2,147	1,348	2,737	1,750
Golfax E. of Cy. Jc. Grass Valley Rd.....					
W. on 37.....		953	441	2,077	1,169
N. on C.R.....		285	168	368	179
E. on 37.....		779	459	2,014	1,092
Emigrant Gap Jc. Rtes. 15 & 37.....					
W. on 37.....		1,300	799	1,695	916
W. on 15.....		78	79	90	32
E. on 37.....		1,282	784	1,662	925
Donner Lake Camp, W. of.....		1,266	1,121	1,687	992
Truckee W. of Cy. Jc. with Rt. 38 S. to Lake Tahoe.....					
W. on 37.....		2,043	1,080	1,230	1,181
S. on 38.....		2,728	1,440	1,287	1,102
E. on 37.....		2,634	1,358	1,580	1,218
Truckee E. of Cy. at Jc. with Rt. 38 to Nevada Line.....					
W. on 37.....		2,650	1,408	1,395	907
E. on 38.....		2,188	1,050	1,300	905
E. on 37.....		456	291	235	151

Route 38. Myers to Nevada Line via Truckee River. (District III)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Myers Jc. Route 11.....					
N. on 38.....		497	292	687	412
S. on 11.....				600	390
E. on 11.....				624	381
Tahoe City at Jc. Rt. 39.....					
S. on 39.....		3,603	2,407	1,608	1,118
E. on 39.....		2,510	2,256	1,353	1,044
N. on 38.....		1,982	1,306	1,292	686
Truckee W. of Cy. Jc. Rt. 37.....		2,728	1,440	1,287	1,102
Truckee E. of Cy. Jc. Rt. 37.....		2,188	1,050	1,300	905
Cal.-Nev. State Line.....		3,428	982	2,255	1,156

Route 39. Tahoe City to Nevada State Line. (District III)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Tahoe City Jc. Rt. 38.....		719	396	1,353	1,044
State Line.....				857	490

Route 40. Route 13 near Montezuma to Route 23 near Mono Lake (District X)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Mt. Pass Jc. Rt. 13.....		819	220	347	182
1 Mi. E. of Groveland.....		883	260	346	202

Route 40. (District IX)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Mono-16-A Jc. Mono 23 H.....		208	197	281	269

Route 41. General Grant Park to Kings R. Canyon. (District VI)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
W. of Hume.....		199	141	176	122

Route 42. Saratoga Gap to Redwood Park. (District IV)		July, 1929		July, 1930	
Station location		Sun. 14	Mon. 15	Sun. 13	Mon. 14
Waterman Switch.....					
E. on 42.....				2,530	534
W. on 42.....				1,397	239
S. on C.R.....				1,388	394

* Count from 6 to 7 a.m. only. Road then closed for repairs.

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Saratoga Gap at Redwood Park Gate	1,228	299	2,636	552

Route 43. Saa Beraardino to Big Bear Lake. (District VIII)				
Foot of Waterman Grade	3,828	1,037	4,508	1,474
Waterman Canyon, Jc. old and new roads,				
Old road			661	254
On new Rd. above Jc.			3,549	955
On new Rd. below Jc.			4,168	1,192
Squirrel Inn Jc. old and new roads,				
W. on old road			539	190
E. on old road			3,574	983
S. on new road			3,616	968
Pinecrest Jc. C.R. to Lake Arrowhead,				
S. W. on 43	3,175	725	3,432	987
N. E. on C.R.	3,053	667	3,456	961
N. W. on C.R.	216	82	252	120
E. on 43	216	73	56	65
Running Spgs. Park Jc. Cy. Creek Rd.,				
W. on 43	639	138	611	153
S. on Cy. Cr. Rd.	938	359	1,315	358
E. on 43	1,488	477	1,807	477
W. end of Br. over Big Bear Dam,				
W. on 43	1,454	592	1,564	502
E. over Dam	1,458	610	1,516	528
N. E. on 43	781	378	805	294
1 Mi. from end of Rt. 43 Jc. C.R. to Pineknut,				
W. on 43	296	201	382	165
S. on C.R.	149	112	603	265
E. on 43	325	212	660	330

Mill Creek Lower Control, S. Bd. Co.

Jc. Big Meadows,				
S. to Redlands	409	141	428	157
S. to Big Meadows	229	53	276	91
N. to Big Bear Lake	207	106	199	87

Big Bear Lake Desert Route

Jc. E. of Baldwin Lake,				
N. to Desert	141	61	163	53
W. to Big Bear Lake	121	51	136	48
S. on E. side of Baldwin Lake	34	10	54	7

Route 44. Boulder Creek to Redwood Park. (District IV)				
Boulder Creek at Park Line	2,311	1,326	2,771	1,396

Route 45. Willows to Rt. 3 N. of Biggs. (District III)				
Willows E. of City	634	742	746	782
Butte Cy. W. of Cy.,				
N. on 45	344	233	404	389
W. on C.R.	180	125	184	196
S. on C.R.	510	509	546	470
E. on 45	513	508	451	438
Butte Cy. 3 Mi. E. of Jc. Chico Rd.,				
E. on 45	107	94	124	122
W. on 45	257	242	253	243
N. on C.R.	163	95	136	124
S. on C.R.	47	98	35	35
Cherokee Canal Jc. with C.R. to Richvale,				
W. on 45	104	82	152	119
N. on C.R.	113	122	103	134
E. on 45	88	97	103	112

Route 46. Route 1 near Klamath River to Route 3 near Cray. (District I)				
Welchpsee Jc. Co. Rds.	54	51	73	41
Thompson Creek	45	58	85	78

(District II)				
Cray N. of Cy. Jc. Rt. 3	318	202	356	276

Route 47. Orland to Chico. (District III)				
Orland E. of City	842	665	1,018	1,037
Ginsell Bridge on 47	947	529	918	662
Chico W. of City,				
W. on 47	1,408	1,130	1,365	1,130
S. on C.R.	679	620	495	542
N. on C.R.	378	408	130	124
E. on 47	1,877	1,634	1,656	1,437

Route 48. Near McDonalds to mouth of Navarro River. (District IV)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
McDonald Jc. Rt. 1	432	278	326	254
Bonneville on 48	619	416	511	355
Navarro, 2.3 mi. W. of town	514	346	410	302

Route 49. Calistoga to Lower Lake. (District IV)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
N. of Calistoga at foot of grade	1,459	610	1,887	823
Middletown Jc. Cobb Mt. Rd.,				
N. on 49	1,350	877	1,873	1,252
S. on 49	1,857	1,182	2,531	1,436
W. on C. M. Rd.	666	448	955	790
Lower Lake Jc. Kelseyville & Lower Lake Road,				
S. on 49	884	431	996	495
E. on L. L. Rd.	1,232	774		
W. on K. Rd.	531	393	503	334
N. on 49			1,236	752

Route 51. Santa Rosa to Shellville. (District IV)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Santa Rosa E. of City	4,248	2,420	4,267	2,634
8 Mi. E. of Santa Rosa at Sonoma Cr. Br.	1,608	2,546	2,874	1,387
Shellville Jc. Rt. 8	3,266	1,012	2,455	845

Route 52. Alto to Tiburon. (District IV)

Belvedere Jc. Rt. 1	2,035	1,109	1,694	940
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Route 53. Fairfield to Lodi via Rio Vista. (District X)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Donverton at Overhead Xing. Rio Vista at Bridge,	537	371	737	453
N. on 53	1,475	1,096	2,253	1,725
W. on 53	2,206	1,374	1,677	1,533
S. on C.R.	1,453	918	1,431	1,044
Walnut Grove at Bridge,				
W.	1,968	1,484	2,367	1,966
E. on 53	1,836	1,298	2,053	1,659
S. over bridge	547	423	601	495
East end of Sleton Br.,				
W. over Br.	2,218	1,760	2,750	1,972
N. on 53	386	833	519	457
S. on 53	2,447	1,932	3,185	2,345
Thornton Interx. C.R.,				
E. on 53	1,205	911	1,701	1,438
W. on 53	1,981	749	1,295	1,083
N. on C.R.	515	402	602	614
Lodi N. of City	1,311	1,303	3,356	2,677

Route 54. Near Michigaa Bar to Central House. (District X)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Central House Jc. Rt. 65 to Placerville & Jackson,				
W. on 54	650	273	610	445
N. on 65	541	349	523	432
S. on 65	594	318	578	418

Route 55. San Francisco to Route 5 near Glenwood. (District IV)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Swimming Pool	17,308	5,275	18,963	5,568
Jc. with C.R. to Colma,				
N. on 55	9,725	1,825	11,536	1,993
E. on 55	3,727	987	4,223	1,138
S. on 55	11,165	1,887	10,985	2,374
Jc. C. R. to Belmont at Dirt Dam,				
N. on 55	5,795	834	7,119	1,171
S. E. to Belmont	2,709	456	3,076	662
S. on 55	5,660	898	7,048	1,468
Jc. Rt. 55 with C.R. W. to Half Moon Bay,				
N. on 55	5,498	834	6,310	1,352
S. on 55	2,187	255	3,328	606
W. on C.R. to Half Moon Bay	3,395	611	3,207	779
Saratoga Gap,				
N. on 55			1,870	335
S. on 55			18	5
E. on C.R.			1,020	222
W. on 42			2,636	552

(District II)				
S. Cl.-S. Cr. Co. Line bet. Saratoga Gap and Route 5	32	9		
S. Cl.-S. Cr. Co. Line Jc. Rt. 5 & 55	166	39	51	52

Route 56. Carmel to Cambria. (District V)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
S. of Carmel Interx. of Carmel Valley and Big Sur Rds.	1,972	1,164	2,066	1,167
San Simeon 1 mi. S.	236	163	452	232

Route 57. Santa Maria to Freeman via Bakersfield. (District V)

Station location	July, 1929		July, 1930	
	Sup. 14	Mon. 15	Sup. 13	Mon. 14
Santa Maria N. of Cy. at Jc. Rt. 2	244	168	327	189

Station location	July, 1929		July, 1930	
	Sun. 14	Mon. 15	Sun. 13	Mon. 14
At Intex Rt. 57 & Suey Rd., S. on C.R.-----	159	69	173	67
W. on 57-----			279	131
E. on 57-----	340	123	400	179
Cayama Lateral between 2d Cayama Xing and Kern Co. Line-----	412	177	293	178
Route 57. (District VI)				
S. L. O.-Ker. Co. Line-----	277	147	444	194
Maricopa W. of Cy.-----	506	338	606	593
Pentland at R. R. Xing.-----	636	772	1,016	917
Bakersfield Jc. C. R. N. to Connor, W. on 57-----	193	169	291	231
N. on C.R.-----	79	80	78	79
E. on 57-----	131	92	221	157
Jc. Rt. 4-----	147	97	160	160
Bakersfield Easterly Cy. Lts.-----	2,570	2,089	2,984	2,572
Bakersfield 10 Mi. E. at Jc. Co. Club Hl. & Ker. 57-E. on 57-----	1,005	471	1,362	354
Bodfish at Intex Rt. 57 with C.R. to Caliente, E. on 57-----	270	147	313	139
S. on 57-----	238	138	287	124
S. on C.R.-----	66	37	44	38
Route 58. Mojave to Arizona Line near Topock via Barstow. (District IX)				
Mojave-----	131	90	146	114
Route 58. (District VIII)				
Kramer near Kern Co. Line-----	84	73	105	102
Barstow N. of Cy. at Jc. C.R. S. on 58-----	376	297		
W. on 58-----	225	172		
N. on C.R.-----	169	152		
Barstow Jc. Rts. 58 & 31 at Mojave River Br., S. on 58-----			1,047	924
N. on 58-----			467	474
N. E. on 31-----			609	471
Daggett Jc. Arrowhead Trail, Old Trails Highway, N. on old 31-----	377	410	111	107
W. on 58-----	826	681	577	506
E. on 58-----	570	471	529	460
Vicinity Newberry Springs, N. on 58-----	355	405	461	393
Vicinity Amboy, N. on 58-----	373	376	405	377
Near Bannock Jc. C.R. to Searchlight, W. on 58-----	294	283	336	297
N. on C.R.-----	23	19	30	34
E. on 58-----	303	249	360	304
Needles W. of Cy. Lts.-----	646	541	601	568
Needles 5.7 Mi. S. Jc. to Parker and Rhythe, N. on 58-----	440	435	374	245
S. W. on C.R.-----	11	26	88	48
S. on 58-----	429	411	203	149
Route 59. Lancaster to Baileys. (District VII)				
Lancaster Jc. Rt. 23-----	690	584	759	830
Bailey Ranch-----	89	84	251	94
Route 60. El Rio to San Juan Capistrano. (District VII)				
Santa Monica Inter. Beverly & L. A.-60-B, Santa Ynez Canyon, W. on 60-----	28,635	11,109	22,283	16,376
On Rev. Blvd.-----	16,611	3,317	13,800	4,966
E. on 60-----	53,303	22,402	48,011	29,211
Lomita on Redondo-Wilmington Rd., on 60, E. of Walnut Seal Beach at L. A.-Orange Co. Line-----	21,332	10,394	23,866	12,003
Newport N. of Cy.-----	16,730	6,940	16,601	7,137
Newport at Intex Newport-Tustin Road, N. on C.R.-----	16,645	7,251	17,001	9,128
E. on 60-----	15,710	6,150	16,258	7,102
W. on 60-----	11,089	4,054	13,430	4,509
S. on C.R.-----	14,104	6,004	14,110	7,293
At Santa Monica Canyon and L. A.-60-B, on Santa Monica Canyon Road-----	25,577	9,876	21,971	13,365
At Topanga Canyon & L. A.-60-B on 60-----	25,152	12,038	32,380	14,582
At Oxnard S. of Cy. Lts. on Ven-60-A-----	9,821	3,758	6,361	4,134
Route 61. La Canada to Mt. Wilson Rd. via Arroyo Seco. (District VII)				
Station location		July, 1929		July, 1930
		Sun. 14	Mon. 15	Sun. 13
				Mon. 14
Pasadena at N. Cy. Lts.-----	2,557	602	3,266	863
Route 63. Big Pine to Dasis. (District IX)				
Big Pine Jc. Rt. 23-----	67	70	99	110
Route 64. Mecca to Blythe. (District VIII)				
Desert Center-----	84	81	76	46
Blythe S. D. A. Quarantine Sta.-----	88	68	111	57
Route 65. Auburn to Sonora. (District III)				
Station location		July, 1929		July, 1930
		Sun. 14	Mon. 15	Sun. 13
				Mon. 14
Auburn at Wire Bridge American River, N. on 65-----	262	116	346	229
E. on C.R.-----	189	66	115	100
S. on 65-----	344	118	292	233
Placerville N. of Cy. Jc. Georgetown Road, N. on 65-----	226	177	304	150
N. on C.R.-----	161	117	108	85
S. on 65-----	292	192	418	246
El Dorado S. of City-----			342	181
Route 65. (District X)				
Central House Jc. Rt. 54 to Michigan Bar, N. on 65-----	541	340	523	432
W. on 54-----	650	273	610	445
S. on 65-----	594	318	578	418
N. of Jackson Jc. Rt. 34, N. on 65-----	875	815	876	963
E. on 34-----	1,362	956	1,282	1,289
S. on 34-----	593	351	592	436
S. of San Andreas at Sheep Camp W. of Sonora, Jc. C.R. to Jamestown, N. W. on 65-----	343	376	223	219
S. W. on C.R.-----	368	194	145	143
S. E. on 65-----	155	348	251	219
Route 66. Manteca to Rt. 5 nr. Mossdale School. (District X)				
Mossdale Jc. Rt. 5-----	3,611	2,128	3,934	2,412
Route 67. Pajaro River to Rt. 2 nr. San Benito R. Br. (District V)				
San Juan Bautista N. of Cy. at Jc. Route 2-----	3,697	1,533	3,861	1,623
Route 68. San Francisco to San Jose. (District IV)				
San Bruno Jc. with Rt. 2 to San Francisco-----	2,185	1,912	2,305	2,325
N. Cy. Lts. So. S. F.-----	7,350	5,369	16,774	11,254
So. San Francisco at underpass, Burlingame, Jc. 68 with Broadway, Burlingame,-----	10,434	4,840	17,513	9,169
N. on 68-----	10,268	4,776	15,915	8,723
S. on 68-----	9,261	3,613	13,941	6,208
W. on Bidwy-----	2,596	2,060	3,715	3,669
Route 69. San Quentin Road. (District IV)				
San Quentin Hill-----	4,964	2,333	4,873	2,618
Route 70. Ukiah to Men. State Hospital. (District IV)				
Ukiah Jc. Route 1-----	1,061	1,066	921	1,079
Route 71. Crescent City to Oregon Line. (District I)				
Crescent City N. of town at Maint. Yard-----	1,053	1,087	923	974
At Oregon Line-----	462	409	447	387

ARIZONA—The Arizona Good Roads Association has approved a proposed amendment to the state constitution to provide a means of road financing and has urged that immediate steps be taken to put it before the voters of Arizona in the November general election.

An expert has figured it out that the electrical energy developed by five million persons, all talking at once, would keep just one incandescent light going. That helps to understand how little illumination comes from most conversations.—*Manchester Union*.

STATE OF CALIFORNIA

Department of Public Works

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B. B. MEEK-----Director

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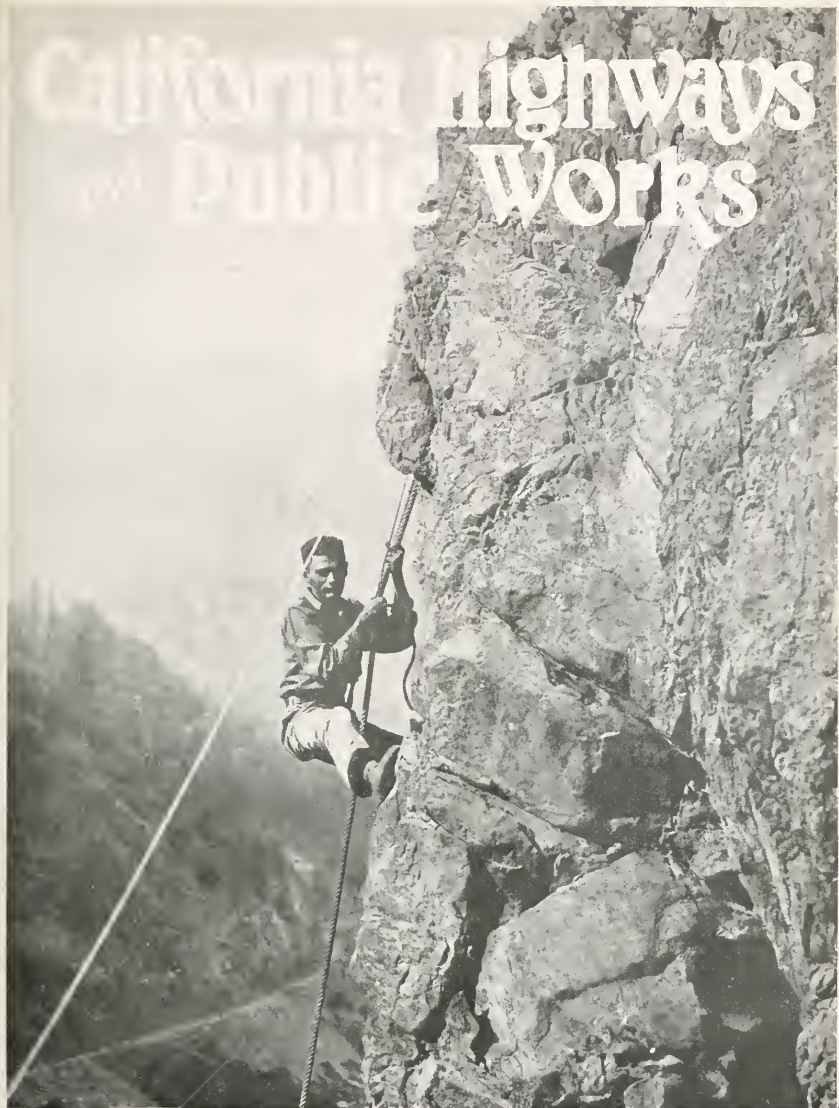
Port of Eureka—F. B. Barnum, Supervisor

Port of San Jose—Not appointed

Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.





SURVEYING A BRIDGE SITE ON THE FEATHER RIVER LATERAL

Official Journal of the Department of Public Works
OCTOBER State of California 1930

OCT 29



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Surveying Under Difficulties

By A. D. HUNTING, Chief of Party

SOME of the difficulties that confront the surveyors of the state highways of California were recently revealed when an assignment came to survey the site for the east arch hinge of the bridge on the Feather River lateral at Pulga.

Upon arriving at the site of the proposed survey and looking over the prospect, the party was for a moment a trifle in doubt as to its ability to get just what was wanted. However, this was a case where the information must be obtained.

The portion of the site covered by the survey was that in the vicinity of the east arch hinge. This hinge falls upon the face of a cliff, approximately 100 feet high, varying in steepness from about a quarter to one slope to an overhang at one or two points. At the foot of the cliff is a ledge, sloping steeply toward the river. At the top of the cliff the hillside

continues on up abruptly enough to require a good deal of care in walking upon it.

The first problem to be solved was the method of obtaining the required data. As the centerline along the cliff is on a curve, whose beginning is inaccessible, the use of cross sections or profiles was discarded due to the difficulty in keeping readings on line. It was decided to locate the breaks in the ground and plot contours on a large horizontal scale. The small interval of two feet was used. From this map such profiles or sections as might be desired could be obtained. The accuracy desired and the large vertical angles that would be necessary rendered stadia unsatisfactory for the face of the cliff. However this method was used to some extent above the rim and at the bottom where readings could be taken nearly level. It was finally decided to take readings by direct

slope measurement with a 100-foot steel tape and vertical and horizontal angles.

Finding suitable points on which to set up the transit was in itself a problem. Four points were finally established and tied in to the centerline, one at the top of the cliff, one on the ledge at the bottom, one on a convenient razorback just south of the centerline, and one on a point of rock jutting out some 20 feet below the rim. This latter was in the shape of a rude triangle about four feet on a side and sloped too sharply toward the river for any comfort. When the instrument was set up, at first there appeared to be no room for the transitman. In getting down to the point on the ledge it was necessary to telescope the adjustable tripod legs and strap the instrument on the transitman's back, allowing him to descend over hand on a rope.

Two ropes were included in the equipment. One was



The transitman at work.



Getting down to the job.

an inch hemp about 125 feet long and the other a five-eighths inch line of about the same length. In devising means for the rodman to reach the various points on the cliff at which readings were desired, several methods were considered and discarded as too difficult or dangerous for the conditions encountered. A large amount of loose rock, in pieces from the size of a walnut to the size of a man's head, resting above the cliff and prone to fall on little or no provocation, rendered the work more hazardous. As many of these rocks as possible were kicked or rolled over the edge before beginning actual work. Great care was necessary throughout to avoid loosening others to fall on the man below.

Tying a man to the end of a rope and raising or lowering him would have been too awkward, and in this case impossible, as only one man was available to do the hoisting. Furthermore, a man's full weight on a rope sliding over the rock rim of the cliff might cut or fray the rope to breaking point or might loosen pieces of rock. On the other hand, the man who can climb or lower himself hand over hand on a rope for a hundred feet, pausing for frequent readings, belongs in a circus rather than on a survey party. Accordingly it was necessary to devise a means of supporting the rodman while giving shots or resting, as well as to guard him from slipping or from the possibility of a dislodged rock fragment stunning him or breaking his grip.

Finally both methods were used. An 8-inch pine tree above the rim served as the anchor for the large rope, which was hung over the cliff. The rodman tied the thong of the tape to the wrist, leaving both hands free, and raised or lowered himself hand over hand on this rope. The small rope was tied to him in such a manner that he was suspended upright in a form of rope eradle. The other end was passed through the ring in the end of an iron pin, conveniently set in a hole in the rock drilled by the crew who made core borings at the site. A turn or two of the small rope was then taken about the iron pin and used as a snub line. One man attended to this line, paying it out as the rodman descended or keeping all slack taken up as he ascended. When a point was reached by the rodman at which a reading was desired, or when he needed a rest, he signalled the snubber, who tightened up on the rope and held him until he was ready to move again. As the major irregularities in the face of the cliff were nearly vertical this method worked

How and Why Auto Accidents take Place Shown by Statistics

Drivers with two or more years of experience at the wheel figured in the greatest number of motor vehicle accidents in California during the first half of 1930 in statistics issued by the Division of Motor Vehicles.

The total number of accidents during the period was 14,213, resulting in the deaths of 1066 persons and the injury of 18,696. The experience of the drivers involved in the mishaps was listed as follows:

Two years or more, 12,673.
One to two years, 333.
Six to twelve months, 108.
Three to six months, 49.
Less than three months, 69.
Not stated, 8,272.

The "dangerous age" for motorists, according to the figures, is from 20 to 29 years, with 5296 drivers in that range topping the list, although somewhat offset by the fact that the age of the driver was not stated in 6014 cases. From 30 to 39 years came next with 3998 accidents, followed by 40 to 49 years in 2657 accidents; 50 years and over in 1908 cases; and the youngest class, 10 to 19 years, in 1631 instances.

In accidents for which the driver was definitely responsible leading causes were given as follows:

Did not have right of way, 3492 cases.
Exceeding speed limit, 2896.
Reckless driving, 1046.
Drove off roadway, 1004.
On wrong side of road, 943.
Skidding, 512.
Failed to signal, 165.
Cutting in, 161.
Car parked on roadway, 122.
Passing standing street car, 55.
Passing on curve or hill, 29.
Driving through safety zone, 25.
"Hit and run" cases, 534.

very well and more rapidly than would be expected. The rodman gave a series of readings from top to bottom, then moved over a few feet and gave another series as he climbed up. The only difficulty was in reaching the face beneath the overhanging portion. This was finally accomplished by swinging in and holding to a projection from the cliff.

By the methods described all the desired information was obtained with no mishaps other than stiff and sore muscles and voracious appetites.



Tahoe Ukiah Highway
East of Nevada City

The Hillside College at Santa Barbara

By ALFRED EICHLER, Architectural Designer

FOR picturesqueness of site and enchantment of outlook, Santa Barbara State Teachers College can hardly be excelled. On the steeply rising slope of Mission Ridge, a short distance from and overlooking the Old Mission, the college occupies several acres of irregular contour. The visitor's first view, on



ALFRED EICHLER.

arriving in the city, is a glimpse of delicately tinted stucco buildings nestling against a background of mauve mountains. A closer approach follows a winding drive up the mountain side through groves of tall eucalypti leading to what has been called the "Inspiration Point" of Santa Barbara. From the campus the city lies almost at one's feet: the glistening blue of the Pacific sweeps across the middle distance, dotted with the white of pleasure craft. Far on the horizon the rugged outlines of the channel islands peer dimly through the veil of the morning haze. In the immediate foreground lie the sentiment and historical association of the Old Mission. It is with this glorious aid of nature that the work of the Division of Architecture has been undertaken.

Of the seven state teachers colleges of California, all save two are situated upon level

or rolling ground. One of the hillside colleges is Santa Barbara.

It seems to be a matter that is generally understood that any group of buildings for a highly specialized purpose, such as a factory, a hospital or a school, should, by reason of utility and economy, be built upon level ground.

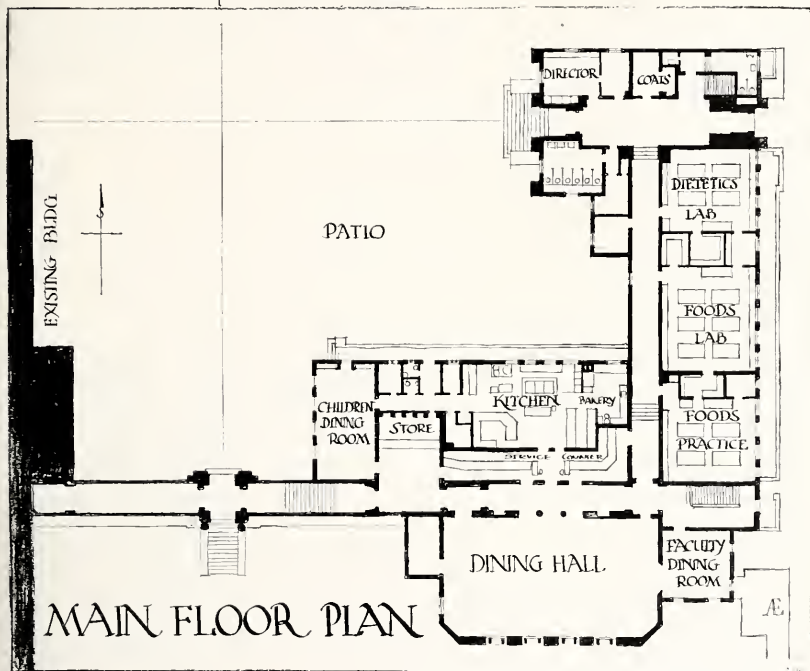
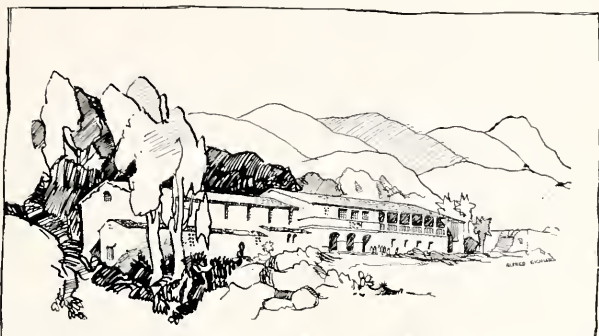
In years gone by, when these sites were acquired for what were then called the normal schools, no one had any idea of the way that these institutions would grow. Keeping pace with the population increase of the state, the small group of buildings of the Santa Barbara State Normal School has grown to be a teachers college with an attendance going into the thousands. Year by year new construction was initiated, to accommodate the growing number of students and to fill the needs of the advancing science of pedagogies. Finally, the time came when it was imperative to plan for the ultimate development of the college. It was found that the value of the plant already erected would require that the site be retained and future buildings correlated to the existing structures, all making a scientifically planned and harmonious whole.

It can not be denied that the layout of the modern educational institution is a complex affair with many ramifications in detail. The



An entrance, Ebbetts Hall of Domestic Arts.

General view of State
Teachers College at Santa
Barbara and main floor
plan.



problem is increased in a considerable measure when the site is an inclined plane, a steep and rocky hillside such as is the described.

This most beautiful location, therefore, presents practical problems in planning and construction. These problems have been approached in a number of ways.

The initial college structure was erected in 1912, and was the nucleus of the institution.

For a long time it housed the entire student body. It was remodeled in 1929 to adapt it to newer conditions. As a site for this building a place on the hillside was leveled off, with sloping terraces on three sides. The plan of this building is, therefore, the same as it would be for a building on level ground. In the further development of the college in recent years, however, it was impossible to use the

same methods of planning, as that would involve leveling off the mountain side. It remained, in studying the plans for the recent undertakings, to obtain practical results by other means.

The Administration Building was completed in 1928. The location selected for it is gently sloping at the east end, where the administrative offices are situated, and drops steeply at the west end, which is occupied by the auditorium. The sloping floor of the auditorium follows the slope of the ground. The difference in floor levels of the building is taken up in the entrance lobby, which is in the center of the building. The college library is on the second floor over the offices, with a reading balcony from which one may take advantage of the expansive vista. Over the main entrance archway is an altorelieve commemorating in sculpture the earliest inhabitants of the region, the Mission Indians.

The Ebbetts Hall of Domestic Arts was completed in 1929. This is a structure with an unusually involved plan, the functions of which required exhaustive research. The building primarily takes care of the college dining hall and kitchen, the Domestic Science Department, and the model bungalow. In connection with the dining hall are the kitchen, children's dining room and faculty dining room, all arranged for cafeteria service. The Domestic Science Department occupies

THE NEW LA CANADA BRIDGE



The above view is that of La Canada arch bridge, built on the Arroyo Seco Highway, approximately one-half mile north of La Canada in Los Angeles County. The bridge was constructed by the Whipple Engineering Company. Its cost was \$31,900.

nine laboratories and a sewing balcony. A room in the primitive colonial style, paneled in pine, and with a cavernous fireplace, serves as an exhibit room for this department.



Ebbetts Hall of Domestic Arts, Santa Barbara State Teachers College.

The slope of the hillside here was uniform, permitting three distinct levels for the three functions of the building. The model bungalow is on the first floor, the kitchen and dining hall on the main floor and the Domestic Arts on the highest level.

The setback in terraces as required by the stepped plan of the Domestic Arts Building blends well with a Persian feeling. In the Garadagh Mountains in Persia the clustered habitations are noted as interesting examples of side hill architecture.

Plans are now being drawn for another unit, the Science Building, which is to be ready for occupancy in the fall of 1931. This structure will house the science laboratories and lecture rooms, with necessary adjuncts, and will be fully equipped in accordance with the latest scientific methods. The studies will be Zoology, Botany, Physiology, Bacteriology, Physics and Chemistry.

This building, while entirely independent of the Domestic Arts Building will be so grouped with it as to form a patio. This patio will be stepped up the hillside in a manner reminiscent of the walled gardens of Urumiah in northern Persia. The botanical and zoological specimens will be arranged in the gardens to give them an entrancingly lovely setting.

The mass of this group will set back in terraces as required by the exigencies of the site. On the highest floor a lecture room will open on a loggia looking far off to the shimmering sunlit sea. Despite all this attention to the esthetic, and reminiscent as it may be of the ziggurats, the building nevertheless will not fail in any detail to meet the highest standards of efficiency, durability and economy.

A comprehensive plan for the entire institution is now in process of preparation which will locate all future buildings and provide space for recreation and athletics. Thought will be given that the magnificent possibilities of site and vistas be used to the fullest advantage.

When Timur-el-leng, the Persian ruler, commissioned his architects, he allowed them "One month to plan; one year to build; riches the reward of success; death for failure." The mortality among architects was high in those days, and few were laden with precious stones and gold. A study of the works of these ancient builders of Persia is invaluable, on account of the similarity to the topography and to the sunny climate of Santa Barbara. They also show the result of much

ingenuity prompted by the architect's urge to retain his head.

A modified Spanish type of architecture has been chosen by the community of Santa Barbara as best expressing the spirit of the locality. The Persian inspiration fits well into this picture; indeed from certain photographs of old world buildings not even the initiated can distinguish the locality so generally does a common feeling run through the primitive architecture of the Southern countries. In this manner with a touch of the exotic, monotony is avoided and a note of interest and variety added to the development of the community of Santa Barbara.

PURCELL ASKED TO SPEAK TO WASHINGTON GATHERING

State Highway Engineer C. H. Purcell has been asked to address the annual meeting of the Washington State Good Roads Association. Mr. Purcell has been asked to outline the work that has been accomplished in California highways during his administration as State Highway Engineer. The meeting will be held in Wenatchee on November 21st, and is to be attended by Governor Hartley of Washington, the highway commission of Washington and practically all the members of the legislature of that state.

PENNSYLVANIA REDUCES NUMBER OF "STOP" SIGNALS

As a movement toward eliminating many "stop-go" signals, the Pennsylvania Highway Department has ordered removed all traffic control lights on state highway intersections with a peak load of less than 500 cars an hour, and where fewer than 125 cars an hour approach the intersection from the side roads.

This is according to information furnished the California Highway Commission by the Pennsylvania authorities. The latter contended that these signals delay traffic rather than regulate it in places where travel is light.

POLITE PLUMBER

The gentleman had sent for a plumber to fix an upstairs tap, and as he and his wife started downstairs they met the plumber coming up. The gentleman said:

"Before I go downstairs I would like to acquaint you with the trouble."

The plumber politely removed his hat and murmured:

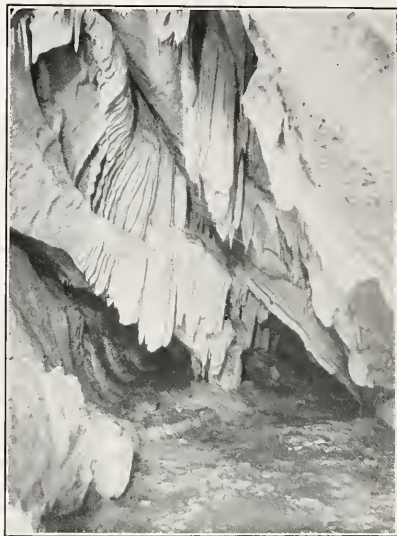
"Pleased to meet you, m's'am."

The esteemed *Literary Digest* is worried lest long skirts will increase traffic accidents, because the women can't move with their accustomed freedom of limb, but we believe that hazards will be offset by the men having their minds set more on driving than formerly. —*Georgia Highways Magazine*.

The Kings River Highway

By R. L. BEUTHEL, District Office Engineer

STATE Highway Route 41, in Fresno County, is a development of a scenic route which had its inception many years ago under the former State Department of Engineering. This department made surveys and constructed a road which led from the north line of General Grant National Park in the high Sierras, to Hume and about four miles beyond to Lockwood Creek. A survey, its objective being the Kings River Canyon (located on the South Fork of the Kings River), was carried down to the Kings River by a devious alignment consisting primarily of curves and switchbacks. Judged by present



Dayder's Cave on Kings River Highway.

only, until the spring of 1929. A day labor convict camp was established in June of last year and construction on a modern standard has been in progress since that date.

The new route follows approximately the old road from the north line of General Grant National Park northerly to Cherry Gap, a distance of $1\frac{3}{4}$ miles. At this point the highest elevation on the Kings River road is reached, being 6790 feet above sea level.

Here the old road and the new divide, the



Limestone Cliff in which Boyden's Caves are located.

day standards such alignment would be pitifully inadequate but it should be remembered that motor transportation was decidedly in its infancy in 1908, and for some years following. Reference is made in the old survey notes of turnouts for teams and wagons and obviously the engineers were planning primarily for horse drawn traffic.

Chapter 232, Statutes of 1909, brought the Kings River road into the state highway system, and it has been under maintenance



Steam shovel at work.

old route following the east slope of Indian Creek and the new road proceeding northerly on the west slope passing three vistas of pine, fir and other varieties of trees. The road follows a descending grade with easy curves, and enchanting glimpses of the high Sierras are opened to view. Through Indian Basin are large stumps and other evidences of lumbering operations which ceased some years ago.

Northeast of Indian Basin stands the Boole tree (accessible by auto and about two miles

mately thirty free men constitute the maximum force which has been maintained to date. Two Diesel powered shovels, of one yard and $1\frac{1}{4}$ yard capacities, are the major items of equipment, and are supplemented by compressors, drills, trucks, graders, tractors, etc.

Leaving the camp the road continues along the west slope of Indian Creek for about half a mile, at which point the drainage basin of Indian Creek widens abruptly, forcing the location to turn northwesterly in order to secure support. Precipitous slopes require



Entrance to Kings River Canyon.

of trail), which is said to be larger than the General Grant tree in the National Park.

At the lower end of Indian Basin lies the construction camp which houses the force of convicts and free men engaging in building the new road. The camp site is quite attractive, having a plentiful supply of cold spring water, surrounded by large trees and sheltered from winds. A level spot in Indian Basin has provided a site for a baseball diamond on which games are played by teams organized from the camp inmates.

One hundred twenty convicts and approxi-

benching or shelving the roadbed or walls where the roadway is partly on fill. Very hard rock has been encountered which has materially slowed progress.

As the descent is made from camp, on grades varying from 5 per cent to 7 per cent, each turn brings into view, more clearly, the high peaks, some of which are over 13,000 feet in elevation, the canyon of the middle fork of the Kings River, and the precipitous sides of the river canyon. Realization of the immensity of the terrain is difficult of comprehension.

(Continued on page 21.)

Where Everything is "Skookum"

By H. R. YOUNGBLOOD, Assistant Superintendent, California Highway Patrol

(This poem is reprinted from the September issue of *The National Motorist*.)

On a trip through the north
We motored this year,
As far as Vancouver,
And what names we did hear.

We went through the Redwoods,
Kept the coast all the way,
Then turned east at Bandon
Near the mouth of Coos Bay.

As we passed the Willamette
What names there we found,
When we crossed into Washington
And around Puget Sound.

Cathlamet and Kalama
Then came Chehalis,
Santiam, Wahkiakum,
Multnomah and Copalis.

Pe Ell and Palouse,
Yamhill and Suhomish,
Skagit and Skapoosie,
Wenatchee and Skykomish.

Chuckanut and Chilliwaek,
Cowlitz, Puyallup,
Toppenish, Moclip,
Tulip and Humptulip.

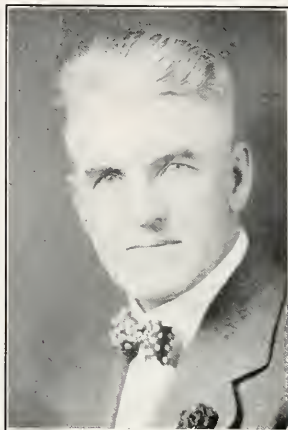
Anacortes, Kapowsin,
Nisqually, Capilano,
Kittitas, Chemainus,
Cle Elum, Kitsilano.

Clatsop and Satsop,
Mukilteo, Montesano,
Quinalt, Esquimalt,
Tenino and Nanaimo.

Then we passed through Issaquah,
Enunclaw, soon Willapa,
Skamania, Skamokawa,
Siskiyou and Suislaw.

Hoquiam and Cowitchan,
Okanogan, Shawnigan.

Toppenish we next did pass,
Cosmopolis and then Camas,
Stillaguamish, Steilacoom,
Umpqua and Sumas.



H. R. YOUNGBLOOD.

Callapoya, Santiam,
Coquille and Clackamas,
Lilliwap and Tillamook,
Enough queer names to fill a book.

We're glad to be at home again,
With easy names to say
Like Sausalito, San Joaquin,
Milpitas, San Jose.

Petaluma, Pescadero,
La Jolla and Mojave,
Why don't those places way up north
Have names that folks can savvy?

Government experts say you can buy more with a dollar now than you could this time last year, and what we hope is that they are now at work on a bulletin telling where to get the dollar.—*Macon Telegraph*.

"Hello, Bill, I haven't seen you for weeks! But what's wrong? You're lookin' seedy. Been ill?"

"No, I ain't been ill, it's work what's doin' the harm—work from eight in the mornin' till six at night, and only one hour off. Think of it!"

"Awful! And how long have you been there?"

"I ain't been there yet. I begin tomorrow."

—*Illinois Central Magazine*.

The Ideal Traffic Patrol Schedule

By VICTOR W. KILLICK, Statistician in charge of Bureau of Research, Statistics and Traffic Safety of the Division of Motor Vehicles

WHEN is a traffic officer needed most? Every chief of police and the Superintendent of the California Highway Patrol knows that motor vehicle accidents increase in some direct proportion to the congestion of vehicles on roads and streets.

Of course, it is relatively a simple matter to provide extra patrols for special occasions such as big ball games, parades and conventions when it is a foregone conclusion traffic congestion will be acute. But what about the every day habits of the average motorist? Is he not as much a creature of habit in his driving each day as he used to be when a mere pedestrian?

If so, perhaps, there may be some sort of fundamental law, or cause, underlying most traffic accidents, which, if it could be accurately understood, might serve a valuable purpose in determining exactly when the traffic cop is most needed—when he can do the most good.

The Research Bureau of the Division of Motor Vehicles undertook to study the matter. The problem was attacked from several angles. The plotting, in chart form, of the hours of occurrence of motor vehicle accidents gave the clue. This chart plainly shows that a very critically dangerous period for motorists definitely exists every day in the year for the six hours between 3 p.m. and 9 p.m. The indications are that this "critical period" operates as a law. It is a constant recurring condition. It is the same for 1928 as for 1929 and for the half of 1930.

All traffic officers in and about large cities know only too well that traffic congestion is always acute about 5 p.m. But relatively few executive officers of police departments realize that there exists a continuous period of six consecutive hours extending definitely from 3 p.m. to 9 p.m. when they should have

not only full strength patrols on duty but such patrols should be reinforced with extra men.

The research survey has clearly brought out the need of this action. It has shown that traffic accidents in the "critical period" are more than twice as frequent as at any other corresponding period of the day, not including the same hours.

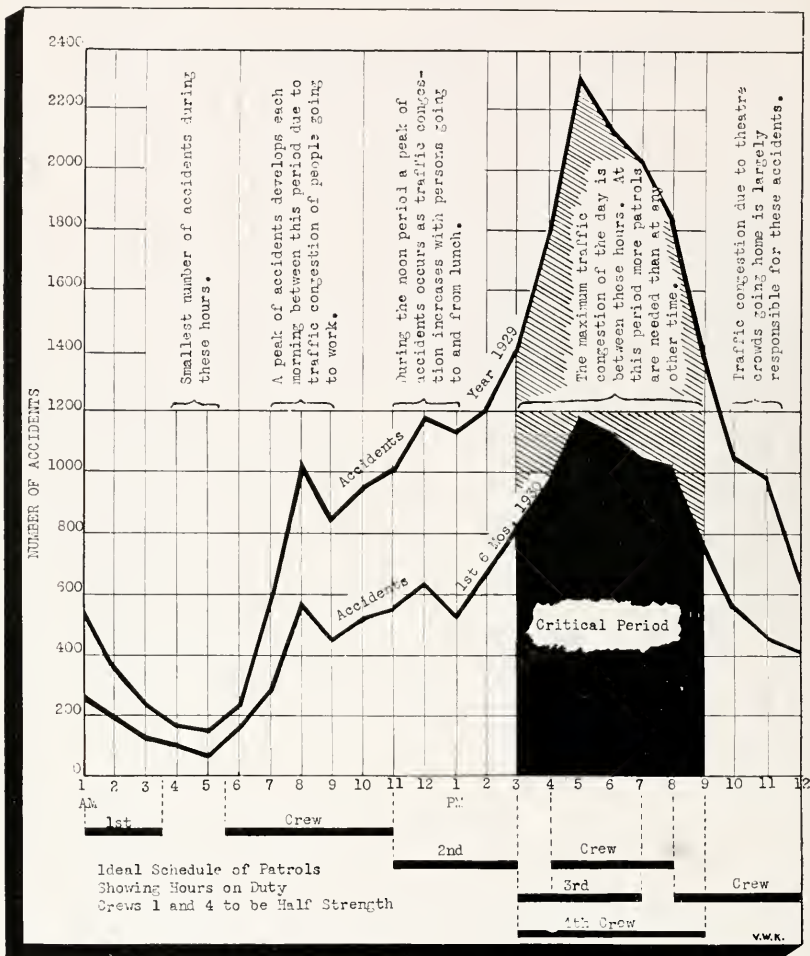
The Research Bureau recommended an "ideal patrol schedule," particularly applicable in and about cities having population of 100,000, or more. It is in such cities, and in a zone not exceeding five miles therefrom, that 68 to 70 per cent of all traffic accidents involving injuries to persons arise.

The "ideal schedule" is a target—something for chiefs of police to "shoot" at. It may not be physically possible for all of them to literally carry it out, but it is based upon the theory that the closer they get to it the more certain we will be to witness a decline throughout the state in the number of accidents now occurring within the "critical period" hours.

The "ideal schedule" provides for three equal sized groups of patrol officers to be subdivided into four working crews. The first crew, a half strength crew, goes on duty from 1 a.m. to 3 a.m., is then off duty until 5.30 a.m. and continues until 11 a.m. Crew two, a full strength crew, starts its shift at 11 a.m., runs until 2 p.m., is off an hour and continues on duty until 8 p.m. Crew three, full strength, starts at 3 p.m., continues to 7 p.m., is off an hour and resumes duty from 8 p.m. to 12 p.m. Crew four, a half strength crew, is a reinforcing crew. It operates straight through for six hours from 3 p.m. to 9 p.m.

The schedule provides for day and night patrols throughout the twenty-four hours, excepting only a two-hour period in the early morning between 3.30 and 5.30 when traffic

TRAFFIC TOLL		
	1929	First six months 1930
Total Motor Vehicle Accidents.....	26,921	14,213
Total Fatal Accidents.....	2,047	971
Total Nonfatal Accidents.....	24,874	13,242
Number of Persons Killed.....	2,244	1,066
Number of Persons Injured.....	35,443	18,696



congestion is minimum. It provides for a patrol service of one and a half to two and a half times normal strength through the entire six-hour "critical period." During the three most dangerous hours of the day, as shown by the chart, between 5 p.m. and 8 p.m. the patrols are at maximum strength.

Chiefs of police in several cities to whom the study was presented have expressed emphatic appreciation of the suggestion. Some will apply the schedule literally. Others

are working out adjustments in their present schedules to get closer to the "ideal." During the current and coming months the Bureau of Research of the Division of Motor Vehicles will attempt to measure the effectiveness of the results of this suggestion statistically.

Tramp: I'm hungry. I got an awful headache.

Cook: What you need is lots of exercise. Why don't you take our axe and get at our wood pile?

Tramp: I ain't got no splitting headache.

California Autoists Pay Lower Car Fees Than in Other States

RESULTS of a nationwide economic survey announced here by the California Division of Motor Vehicles show Californians are paying less in fees for the privilege of operating motor vehicles than motorists of most of the other states and are enjoying superior advantages.



VICTOR W. KILLICK.

Of twenty-five states visited by Victor Killick, statistician and research engineer of the department, in making the survey, not one had a registration fee as low as the \$3 flat fee charged in California for registration of passenger vehicles.

Most of the states were found to be still employing the old horsepower rating system or scheduling their fees on a weight basis. Under these systems fees were found to range from \$8.80 for light vehicles to \$30 and \$40 for the larger and heavier types.

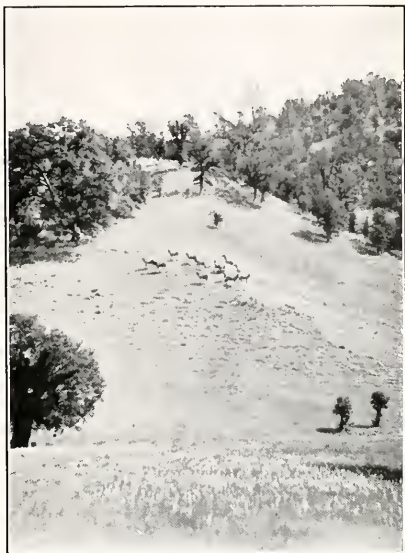
In one state the registration of a heavy vehicle used for commercial purposes was found to cost between \$450 and \$500 annually.

It was found that practically every state makes an annual charge to applicants for licenses to operate motor vehicles and some make a further charge for examination of such applicants. These fees were found to range between \$1 and \$2 a year, motorists of some eastern states paying a total as high as \$5,000,000 for such licenses and examinations.

California applicants for operators' licenses pay no fee whatever and are examined free of charge. Although the law requires that licenses be renewed every two years there is no charge for renewal, as in many states.

Killick learned that in one state motorists

ELK ALONG THE HIGHWAY



The above picture shows a herd of elk as photographed along the Tahoe-Ukiah Highway on Bear Creek in Colusa County.

whose licenses are revoked may obtain a hearing before the commissioner of motor vehicles only upon payment of a fee of \$5 in advance. In California every motorist is entitled to a hearing without cost.

The motorist registering a motor vehicle in California for the first time receives a title certificate (pink slip) without extra charge, if he be the legal owner and if he is not the certificate is mailed to the legal owner without added cost.

Many states were found by Killick to be exacting a fee of \$1 for this certificate. Fees for the transfer of ownership of cars were found to be from 60 to 100 per cent higher than in California.

California motorists paid an aggregate of some \$10,500,000 in 1929 for registering their cars. New York motorists, however, with only a few thousand more cars, paid \$38,250,000 for the same service while Pennsylvania motorists, with less cars, paid \$29,250,000.

All the states visited by Killick employ the gasoline tax. Twenty were found to have a

(Continued on page 18.)

The Scenic Skyline Boulevard

By COLONEL JOHN H. SKEGGS, District Engineer

THE Skyline Boulevard, Route 55 of the state highway system, was primarily designed on a basis of utility; first, it was planned to serve the heavily settled urban territory south of San Francisco as a relief to the overburdened El Camino Real, or Peninsula Highway, for ingress and egress to and from the city of San Francisco; second, it offered facilities for a faster express route to the city of Santa Cruz and Monterey coast points by by-passing all the towns en route and avoiding the ensuing delay occasioned by congestion due to cross traffic and commercial settlements; third, it provided quick and easy access to the coast territory and the many resort sections on the west slope of the coast and Santa Cruz Mountains; and fourth, it served the intensively cultivated agricultural sections just outside of San Francisco and the stock and small fruit ranches through which the Skyline Boulevard passes further south, as a commercial road for transporting their products to market.

SHIFTING PANORAMA OF BEAUTY

Although basically the Skyline Boulevard is a road of utility it is also a highway of scenic beauty. Briefly stated, the scenic attractions of this splendid road in the forty-

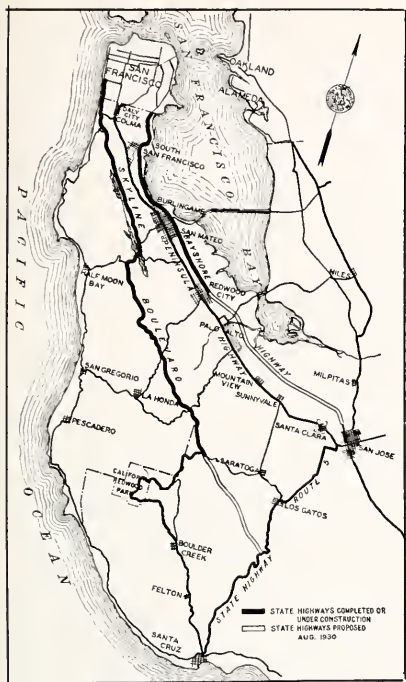
eight miles of state construction completed at the present time comprise four miles affording various views and glimpses of the ocean, one mile passing beautiful Merced Lake, fourteen miles in which Crystal Lake is the dominant scenic feature, twenty-four miles affording magnificent panoramas interspersed with brief glimpses of the valley and San Francisco Bay, and several miles passing through three different golf courses, where natural and artificial beauties are harmoniously blended.

APPROACH THROUGH SAN FRANCISCO HIGHLANDS

The approach to the Skyline Boulevard through the highlands of San Francisco is extremely pleasing. One mile from the end of Market street on Portola drive the first three-quarter-mile view is had of the bay to the southeast, after which the traveler proceeds through the pretty, green Twin Peaks residential district to the intersection of Junipero Serra and Sloat boulevards. Proceeding for two miles along the wide double Sloat Boulevard with the foliage of the Municipal Playground on the left, the intersection with the Great Highway and the beginning of the Skyline Boulevard is reached. Here the street car tracks tunnel



View of Crystal Lake as seen along the Skyline Boulevard.



Map showing the Skyline Boulevard.

under the large intersection, leaving it unhampered for automobile traffic.

GLIMPSES OF THE OCEAN

Progressing along the Skyline Boulevard the ocean may be viewed from near sea level either from the highway or from a spacious observation point on the right. A pleasing view of Fleishbaecker's large and happily crowded swimming pool is had, after which



The road over Crystal Lake.

the parked areas of Fort Funston on the right and Harding golf links on the left are traversed. An interesting short side trip into the golf links is here offered with branches of Merced Lake viewed first from one side, then the other, in enjoyable variety. For a distance of one mile from the entrance to Harding golf links, Merced Lake is seen through the trees and heavy foliage on the left, after which the climbing highway for another mile passes through the grounds of the Olympic Club golf course on either side with perfect harmony of artificial and natural beauty, from which section the ocean may be viewed on the right below. From here the ascending road passes through truck garden fields for several miles, where the first real magnificent view of the valley and San Francisco Bay is sighted directly ahead along the highway.

CRYSTAL SPRINGS LAKE

About ten miles out on the Skyline Boulevard the first fleeting glimpse of Crystal Springs Lake on the right is had, while a panorama of the bay is enjoyed at the same time on the left.

At fourteen miles on the highway the last panorama of the bay is snatched away as the motorist enters the grounds of the Crystal Springs Country Club, the golf course of which is enjoyed on the right for the next mile and a half. The ensuing three miles traverses the shores of Crystal Lake, the highway crossing directly over the interlocking concrete, earthquake-proof dam with its unique observation point and memorial to Schussler, its builder.

From the earth dam, which divides Crystal Lake into two parts, the highway climbs two miles to the Half Moon Bay road, where Crystal Lake, now far below, and a panorama of San Francisco Bay across the intervening hills can be viewed at the same time.

The next four miles of the ascending highway affords a glimpse first on the right of the Pacific Ocean, then a glimpse of Crystal Lake and the bay on the left, each view being withdrawn before the full import of the beauties shown can be realized, the last half mile of this section affording a wonderful, broad panorama of the bay and valley on one side, immediately followed by equally as imposing a view of the ocean on the other.

THROUGH THE FORESTS

At this point the motorist is suddenly relieved from wide views and plunges into the cool, refreshing shade of the timber with a teasing glimpse of the bay now and then

afforded through the trees on the east side of the highway. This five-mile stretch of road passes through a timber belt on Kings Mountain comparable to the heavy stands of Humboldt and Mendocino counties.

INSPIRATION POINT

Approximately thirty miles out, the traveler reaches Inspiration Point, from which place the entire valley and San Francisco Bay spread out below, with a background of mountains east and north of the bay, revealing Mount Tamalpais, Mount Diablo and Mount Hamilton.

The next seven miles of highway is a typical mountain road with fleeting though often unsatisfying glimpses of the bay and valley on the left, alternated with beautiful views of the Santa Cruz Mountains on the right, after which four and one-half miles along the east side of the ridge give an almost uninterrupted panorama of the bay and valley on the east. The mountains on the west are the dominant feature from here to Saratoga Gap through which, however, a framed picture of the valley on the left may be had.

THIRTEEN COUNTIES FROM ONE POINT

Three miles south of Saratoga Gap on the proposed but as yet unconstructed fourteen-mile section which connects with State Highway Route 5 between San Jose and Santa Cruz, Castle Rock Ridge, the highest point in the Santa Cruz Mountains, is reached, from the summit of which on a clear day thirteen counties, the Monterey coast and the Farallons can be seen at one and the same time. The government Rangers' station and observation point is located upon this mountain.

FAIRYLAND OF LIGHTS

The beauties of the Skyline Boulevard can not be fully appreciated by traveling it in one direction only. The trip from Saratoga Gap toward San Francisco is particularly impressive at night, with the thousands of twinkling lights throughout the valley and the illuminated transbay bridges, ferries, etc., in the bay, making impressions which are not easily forgotten.

THE BEAUTY OF THE FOG

Due to the fact that this highway is located along the summit of the mountains, particularly on the Santa Cruz end, fogs often occur far below the level of the road and especially on a moonlit night this presents a sight of such rare silvery beauty as to be incapable of description.

It is seldom that one highway combines the

beauties of the mountains, the sunsets of the desert, the fogs of the ocean, the panorama of a great historical bay and the magnificent urban valley of a large city in as many varying phases by daylight or starlight, and only those who travel it many times ever learn the full potency and charm of the scenic Skyline Boulevard.

EASY OF ACCESS

Although the distance from San Francisco's central business district to the Skyline Boulevard is greater than that to the Peninsula Highway, the latter, inside the city limits of San Francisco, has some three dozen cross traffic streets in a continuous busy commercial district. About one-third of these are equipped with "Stop and Go" signals. This is in contrast to the approach to the Skyline Boulevard by way of the wide Portola and Sloat boulevards, where cross traffic is almost negligible. Additional access is had to this important state boulevard from all parts of San Francisco through direct connections to Market street, Twin Peaks and Junipero Serra boulevards, Nineteenth avenue and the Great Highway along the ocean shore.

The Skyline Boulevard without becoming involved in cross traffic taps the Peninsula interurban territory with improved lateral roads at Colma, at San Bruno and at Millbrae, each two miles east of the highway; also at Burlingame and San Mateo, each four miles, and at Belmont five miles east. Woodside and Redwood City are served by two roads from the Skyline; Palo Alto, Mountain View and Los Altos also have a connecting road, and Saratoga, seven miles east of the Skyline Boulevard, is reached by an excellent county road recently brought to a higher standard, involving much heavy construction work.

The through route to Santa Cruz is accomplished at this time by a connection at Saratoga Gap, the present terminus of Skyline construction, with State Highway Route 42, which joins with excellently paved Santa Cruz County roads passing through the town of Boulder Creek and on to Santa Cruz.

WORK UNDER WAY

Upon completion of the fourteen-mile unit of the Skyline Boulevard between Saratoga Gap and Woodwardia upon State Highway Route 5 between San Jose and Santa Cruz, this improved condition will be accentuated and travel will proceed from the heart of San Francisco to Santa Cruz on a road of the highest standard at an uninterrupted rate of speed

(Continued on page 19.)

Traffic Stripe on California Highways

By T. H. DENNIS, Maintenance Engineer

DURING the year 1929 some 1800 miles of California state highways have been striped for the safety and convenience of traffic. The work was first initiated as a state-wide program in 1926, when a special crew was organized. In 1927 some 300 miles of traffic line was placed on curves and on the most heavily traveled routes. The work was extended in 1928 and the 1929 program is being repeated in 1930.



How the highway stripe is made.



Striping the highway makes mountain driving much safer.

It is planned to further extend this safety measure and estimates have been prepared to provide for striping 2200 miles of pavement or the equivalent of 3500 stripe miles annually for the 1931-1933 biennium.

PROMOTES SAFETY

It is felt that this safety measure more than justifies the considerable annual expenditure which is necessary. On unmarked roads many drivers feel that they are entitled to crowd to the center of the road, particularly on the more narrow, dangerous mountain

sections. For such drivers the white traffic line is a constant reminder to hold to their own side of the road and also relieves the tension of timid ones who may now watch the line instead of the edge of the pavement on the shoulder. Driving at night or in foggy weather is found to be much easier and safer with the guiding aid of the traffic line and all traffic is speeded up without increased hazard.

VALUE OF WHITE LINES

When the work first started a line six inches wide was placed, and white, orange and yellow paints were used at various points. The present standard line is four inches wide and white traffic lacquer is used exclusively. The white has better visibility at night and also as the line gets old. Lanes ten feet wide are standard, although 18-foot pavements are also striped. On the narrower pavements stripes are placed only on narrow bridges, on curves and other danger points. Stripes are placed along the pavement edges in foggy areas and also where the pavement edge is



Traffic lanes leading into a California city.

not well defined as on loose oiled shoulders where the similarity in color otherwise prevents the driver from determining the limit of the pavement, particularly at night.

HOW LINE IS PLACED

Where a new line is placed, care is taken to mark the line out ahead of the painting to insure a true uniform job. Small irregularities in the line are greatly magnified to the critical eye and the extra expense of this detail is well worth the effort.

Seven special crews are now assigned to the work. The usual crew consists of three men, a paint machine operator, a truck driver, and a helper who places and picks up flags used for protecting the line and also assists in mixing the lacquer.

The paint machine is a hand propelled spray outfit operated by compressed air. A screen side truck is provided for transportation of men and supplies.

QUALITY OF PAINT

In the early stages of the work, a white paint, made up according to state specifications, was used, but for the past two years commercial traffic lacquer has been used. Before purchases are made, samples are submitted by the vendors and tests are made in the laboratory, and results compared with similar tests on material which has previously given satisfactory results.

For best results, the white lacquer must furnish the maximum amount of opacity and visibility. It must dry rapidly so that traffic will not be inconvenienced or the pavement marked by machines tracking the line. It must be uniform, must provide a good film and spread, and it must be enduring.

Where a uniform edge of pavement is exposed or where longitudinal joints are in proper position, the line to be painted may be located by an outrigger attachment or the expansion joint followed. Generally, however, it is necessary to mark out the line in advance. This is accomplished by means of a one-half inch rope, about 300 feet in length, which is placed in the position desired by measuring from edge of pavement or by eye, as local conditions require. Spot marks are made with paint at intervals of two or three feet along this line. If the spot marks are too far apart the operator has difficulty in following them and an irregular line results.

GUARDING AGAINST TRAFFIC

Lacquer is purchased in five-gallon cans. It is mixed with thinner in the tank of the

spray machine, which holds eight gallons. The particular material used this season requires 3/10 gallon thinner to one gallon of lacquer to work through the machine. Air pressure used varies from 15 to 20 pounds. The machine is pushed by one man. The truck follows immediately behind, straddling the line as a protection to the machine operator. The other man in the crew sets a flag on the line at intervals of about 100 feet. These flags are supported by bent wire or small pipe stands with "X" bases.

When a tank of lacquer is run out, the operator and helper mix a new lot and the truck is sent back to pick up the flags. The lacquer dries in about ten minutes time after being spread. Even with the flags in place, it is difficult to keep machines off the line and it is usually necessary to secure aid from the local traffic officers to prevent tracking up the pavement. For marking line along the edge of pavement, an offset has been arranged to permit the machine to ride entirely on the pavement. It is not possible to secure a good line with one wheel on the shoulder.

About 12 gallons of lacquer and 3.6 gallons of lacquer thinner are required for each mile of 4-inch line. The average cost is \$40 per stripe mile. The lines are placed before the beginning of the winter season to secure maximum benefit. In general, a line is painted only once a year, although where traffic is heavy or conditions especially dangerous, the lines are renewed every six or eight months.

CALIFORNIA AUTOISTS PAY LOWER CAR FEES THAN IN OTHER STATES

(Continued from page 13.)

4-cent tax which is one cent higher than California. Nine have a 5-cent tax and three have a 6-cent tax.

In several states it was found gasoline taxes are diverted for general administration expenses or schools and other purposes, the motorist thus being compelled, as a class, to support various functions of government in addition to road construction.

The California motorist gets the full benefit of the gasoline tax inasmuch as all of it is spent on the highways.

OHIO—Fatalities due to automobile accidents in the state of Ohio increased 25 per cent during January and February, 1930, as compared with the same months for 1929, according to a report filed by the Chief of the Division of Vital Statistics with Dr. Charles A. Meal, Director of Health.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

B. B. MBEK-----Director
GEORGE C. MANSFIELD-----Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 8 OCTOBER, 1930 No. 10

Consulting Board Is Named to Advise on Pasadena Dam

The city of Pasadena, through its chief engineer, filed application with State Engineer Edward Hyatt, in accordance with the law governing the supervision of dams, on September 30, 1930, for approval of plans and specifications for construction of the Pine Canyon Dam to be built on the San Gabriel River. As provided for in this law, it is mandatory that the State Engineer cause an examination to be made of the site, review the plans and specifications, and approve or disapprove the application.

Because of the importance, magnitude and location of the proposed dam and the many involved technical features, the State Engineer has appointed a consulting board consisting of Chas. P. Berkey, Professor of Geology, Columbia University, New York City, N. Y.; Geo. D. Londerback, Professor of Geology, University of California; Ira A. Williams, Consulting Geologist, Portland, Oregon; J. L. Savage, Chief Designing Engineer, U. S. Bureau of Reclamation, Denver, Colorado; George A. Elliott, Consulting Engineer, San Francisco; and M. C. Hinderlider, State Engineer, Denver, Colorado, to investigate and report upon the safety features of the structure.

These nationally known consultants, possessing unquestioned ability and integrity, are preeminently qualified and widely experienced in their respective professions. They are to complete an intensive examination of the site of the proposed work and comprehensively review all technical phases of the proposed dam. The results of their investigation, together with their conclusions, will be embodied in a report to the State Engineer upon the safety features of the dam.

This board consists of the same members who last November reported to the state regarding the proposed Forks dam on the San Gabriel a few miles above the Pine Canyon site, and are therefore already generally familiar with San Gabriel area.

The Pine Canyon Dam will also be under the jurisdiction of the U. S. Forest Service, and the Federal Department through Mr. E. W. Kramer, Regional Engineer, will cooperate with the state in the investigation.

THE SCENIC SKYLINE BOULEVARD

(Continued from page 16.)

approaching the maximum allowed by state law.

Connections to the coast towns of Salada, Montara and Princeton are had from the Skyline Boulevard at a point approximately twelve miles from the Civic Center of San Francisco. Sixteen miles beyond this point the Half Moon Bay road, now under process of reconstruction and improvement by San Mateo County, affords connections to Half Moon Bay and Pescadero, on the west coast. Thirteen miles further on, the La Honda Road proceeds west to La Honda and San Gregorio. At Saratoga Gap there is a far more important connection via the Big Basin state road to California's largest state owned park, comprising 10,000 acres in the heart of the Santa Cruz Mountain redwoods, fifteen miles west.

The surpassing beauty of this mountain redwood section is fast becoming recognized as is evidenced by the heavy increase in the number of visitors to the park yearly; the past season as many as five thousand people visiting the park on holidays. Construction work now in progress between Saratoga Gap and Big Basin, due for completion in early 1931, is expected to further increase this number of visitors in the coming year.

The Skyline Boulevard passes through about seven miles of territory in the north end of San Mateo County which is devoted to intensive truck gardening, seeking San Francisco as a market and requiring almost daily use of the highway for a greater portion of the year. The many small stock ranchers and farmers south of this intensively cultivated section, although less in number, find the use of the highway equal in importance to that of the regions closer to the city.

NATIONAL.—Secretary of Commerce Lamont estimates that highway construction this year will afford employment for probably more than 500,000 men. This estimate is based on the return of construction contracts awarded in the various states.

California Association of Highway Patrolmen

By JOHN SANSONE, Secretary-Treasurer

THE California Association of Highway Patrolmen is an organization composed of bona fide traffic enforcement officers throughout the state and its various cities and municipalities. Today its roster shows 348 paid-up members, compared to the 21 motor



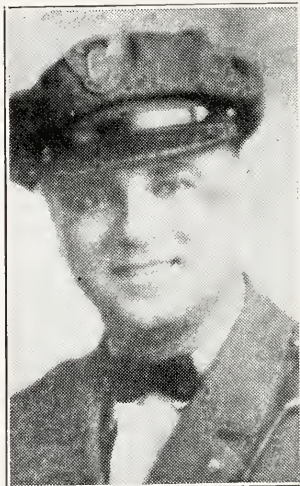
HENRY LIVINGSTON,
President, California Association of
Highway Patrolmen.

officers who organized the association in San Jose, California, on September 15, 1920. On June 15, 1929, the association was incorporated under the laws of the State of California as a nonprofit organization, acquiring state recognition and all legal rights of a corporate body.

The purpose of the association, primarily, is to devise ways and means of furthering the best interests of its members. Toward this end, a fund has been created out of which the sum of \$1,000 is paid to the widow, orphans, or dependents upon the death of a member. Traffic officers are classified by a majority of the old line insurance companies as being employed in an extra-hazardous occupation, and by reason of this fact, accident and life insurance policies for these men require the payment of a large premium. The association is at the present time carrying its own insurance, although plans for group insurance are in the offing. The only fees are the \$6 annual dues, and an assessment of \$2 whenever a member passes away. An initiation fee of \$10 is paid upon a member's being admitted into the association.

Prior to every legislative session, the association has gone on record as recommending the passage of certain proposed amendments to the motor vehicle regulations. This is another purpose for which it is organized, and since its members are engaged in the business

of enforcing motor vehicle laws, it naturally follows that the association is vitally interested in legislative enactments affecting such laws. It is reasonable to assert that traffic officers are highly qualified to decide whether proposed changes in the statutes, which have been thrashed in theory by the state legislators, are feasible in actual application. The position of the traffic officer was recognized by the California Safety Conference when the president of the association was elected to the board of directors of the conference, which was organized early in 1929 for the purpose of conducting educational campaigns among the motoring public and sponsoring favorable motor vehicle regulations. Due to a mutual interest in the solution of certain road problems, a splendid cooperation exists between state traffic officers and the personnel of the State Highway Commission. The board of directors of the California Association of Highway Patrolmen has seen fit to commend officially the Department of Public Works for



JOHN SANSONE,
Secretary-Treasurer, California Association of Highway Patrolmen.

its activities in aiding the motorist and in minimizing the number of automobile accidents.

The association meets as a body once a year in annual convention. It meets this year at the Hotel Del Monte for three days, October 21, 22 and 23. A lively program has already been prepared by the Convention Entertainment Committee, which includes sight-seeing trips, theater parties, and interesting athletic events not only for the members, but also for the wives and lady friends attending.

A board of directors is the governing body of the association. It meets occasionally at the call of the president, and its activities are communicated to each member by the Secretary-Treasurer through bulletins announcing the proceedings of the board. The officers, which also constitute the Board of Directors, are as follows: H. H. Livingston, Salinas, President; Frank J. Duncan, Merced, Past President; Charles Goff, San Francisco 1st Vice President; J. A. McCaleb, Los Angeles 2d Vice President; Miner Carter, Red Bluff, 3d Vice President; Otto Langer, San Diego, 4th Vice President; H. D. Cloughley, Sacramento, Director; John Sansone, San Jose, Secretary-Treasurer; and C. J. Boone, San Bernardino, Sergeant-at-Arms.

THE DESERT HIGHWAY

Conceived in the brain of man,
Constructed by man's toil,
Stretching across the desert waste,
A carpet of rock and oil.
Not a magic flying square,
Renowned in the fable of old,
But a satin ribbon of rock and oil,
By the hand of man unrolled.
Fable has turned to truth:
The rock with the oil smooth-bound;
What need to fly through the air,
When the "ribbon" is on the ground?

—Jos. E. Rich.

These pocket-handkerchief golf courses are bringing the game within reasonable bounds. We expect to hear any day of a player who has made eighteen holes in one.—*Boston Transcript*.

Sandy, who owned a theatre in Dundee, went to London to get some ideas for advertising.

While walking through the great city, he saw a notice outside a movie to the effect that all persons over 80 years of age would be admitted free.

"Just the thing," he told himself.

The following day Sandy returned to his native town and the first thing he did was to put a notice outside his own theatre which read:

"All persons over 80 years of age will be admitted free, if accompanied by their parents."—*Answers*.

THE KINGS RIVER HIGHWAY

(Continued from page 9.)

About seven miles from General Grant Park, the constructed road ceases and merges into preliminary work such as clearing, drilling, blasting and removal of material already blasted. Ahead of these activities the engineers are busily engaged in setting stakes to guide the construction forces. Further in advance is the location party of engineers occupied in collecting survey data for the location of the road. The work of this party would not attract anyone who is averse to strenuous physical effort as it consists of a hard hike in the morning from camp to the work over a makeshift trail or no trail at all—after climbing up steep hillsides—working along country steep and rocky or covered with thick brush, climbing up and down cliffs where ropes must be used for life lines and a return to camp which may be a hike of 30 minutes to two hours. A misstep in this country may easily result in a fatal fall. Rattlesnakes are encountered quite frequently.

Continuing along the west slopes of Indian Creek drainage the road will descend with good alignment to Ten Mile Creek and follow the latter creek to the junction of the Middle and South Forks of the Kings River, where it will turn easterly along the South Fork. After crossing Redwood Creek the location of the new road follows the south side of the river and approaches Horseshoe Bend. Here the river makes an "S" turn between almost vertical rock walls more than a thousand feet in height. Just what type of engineering expedient will be used at this point has not been decided, but the gorge should not fail to thrill the most jaded traveler.

Other points of interest will be seen, before the canyon proper is reached, one of the most interesting being Boyden's Caves. These are situated in a huge limestone cliff and are very spectacular. Before reaching the main canyon the road will descend to practically water level and enter the canyon. The canyon is a narrow valley with huge side walls replete with magnificent panoramas rivaling the world's most famous scenery. Recreational areas now accessible by trail only will be brought within the possibilities of week-end trips.

The road when finished to Copper Creek, in the canyon, will be approximately 38 miles in length.

VIRGINIA—A landscape engineer has been added to the staff of the department of highways.

Road Engineers From All Parts of World Meet at Washington

The United States, with its 600,000 miles of improved highways, is to serve as a "giant laboratory" for highway engineers and executives from all parts of the world.

The congress, first to be held in the Western Hemisphere, opened on October 6 in Washington, and will be followed by tours of delegates to various portions of the country for the inspection of highway and other conditions.

The purpose of the conference was recently outlined by Roy D. Chapin, president of the America Organizing Committee for the Sixth International Road Congress. He is quoted in the United States Daily as follows:

Fundamentally, these highway engineers are the vanguard of modern life. Upon the success of their efforts rests the opportunity of hundreds of millions of people to obtain for themselves new standards of living, new insight into the customs of their neighbors, new markets for the commodities they may produce.

As their work progresses, they will give new stability to government, new employment to vast hosts, new areas for you and me to explore with our families.

This matter of highway building is a very practical business. It requires inventive genius, thoughtful planning, sane administration, economic adjustments, financial arrangements, hard labor, and a certain schooling in the art of diplomacy. Only by a careful mixing of these ingredients does the taxpayer receive for his dollar, or its equivalent, the widest, longest and the best stretch of usable road.

CHANGES IN TWENTY-FIVE YEARS

Perhaps the simplest way in which to visualize the importance of this conference is to think back 15 or 25 years ago.

How far could you travel then over an improved road in the United States?

How long did it take you to go to nearby towns or farms over the highways?

How many of your friends had automobiles?

How many long trips had you taken?

The answer expressed statistically is that 25 years ago there were less than 25,000 automobiles. Now there are over 26,000,000 motor vehicles. Then only 155,000 miles of improved road existed in all the United States.

Of that road but 144 miles had a high type surface. Today there are more than 600,000 miles of improved highway and another 500,000 miles of usable dirt road.

Where we were then spending less than \$100,000,000 a year in our highway improvement, today we are spending more than \$1,500,000,000 annually. Our people want more roads than are being built.

Now you can travel from any county seat in the United States to any other over an improved road, and there is no community isolated.

No longer are our rural folk cut off from the cities and if we still have far to go, the sheer wealth made possible by this new form of transportation, we have provided ourselves with ample means to carry on without hardship to the individual.

Vast areas of the world outside of the United States and part of Europe are today in precisely the situation which faced our fiscal authorities and our highway engineers years ago.

EFFECT ON WORLD RELATIONS

The effect upon world relations can best be depicted by a few examples.

Ten of the leading engineers of China are attending the congress. They come to find ways and means of extending the 34,000 miles of road which China has today into the inland provinces as a first essential step in the campaign to prevent the starvation annually of millions of people subject to famine because of lack of transportation.

From our neighbors in the Latin Americas we have as guests leading highway administrators whose task it is to provide ways and means of traversing the pampas, piercing the jungles or crossing the high mountains of the Andes.

Already the countries of South and Central America are making great headway. Buses now run through the passes of the Andes between the Argentine and Chile. Uruguay has many miles of modern road.

A triweekly postal service links together the coastal towns of Peru formerly cut from all but an intermittent steamship service with no communication with one another.

Brazil is pushing its roads south to Uruguay and west to Bolivia.

Venezuela is actively at work on main highways, while the new president of Colombia is intent upon securing loans for main roads to open up vast resources of his country.

Chile has a fine program under way. Chilean engineers have been touring our western states as guests of their highway departments for the past week, studying roads there where mountain conditions are similar.

Ecuador, Bolivia and Paraguay are all deeply interested in opening up their storehouses of natural resources through roads.

In Central America an inter-American commission is already formed to study a road from Panama to the United States which will permit a free flow of traffic from north to south. Panama, Guatemala and Salvador all have their links well under way.

Our great neighbor to the south, Mexico, is vying with our friends in Canada in the development of main and lateral roads and travel to Mexico City over the highway is now an accomplished fact.

Japan, Indo-China, India, Nigeria, Libia, Algeria, Morocco, these are but a few of the nations or colonies of the world, which will have engineers in attendance at the Road Congress.

Australia is sending men from New South Wales, Queensland and Victoria. New Zealand and New Caledonia alike will be represented.

(Continued on page 28.)

Sacramento and
San Joaquin
Water Resources
Study

Activities Among
Irrigation Dis-
tricts by State

September Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

State Approval
of 700 Dams
Requested

Applications and
Permits Filed For
Water Approp-
riations

WATER RESOURCES INVESTIGATIONS

SACRAMENTO VALLEY INVESTIGATION

An office report on the relation of the seasonal return water to seasonal diversion and the monthly distribution of the return water, was completed during the period and sent to the members of the Engineering Advisory Committee.

Flood concentration studies were completed for the Sacramento Valley at the latitude of Sacramento for the Feather River Basin. Flood frequency curves have been developed for the major streams of the basin. Surveys were made for dam sites on the Sacramento River in the vicinity of Table Mountain. These sites are about fifteen miles above Red Bluff. Studies have been continued to determine the most desirable method of operating the Trinity River diversion in connection with the storage reservoirs on the upper Sacramento River. Studies have been made to determine the economic installed capacities for power plants at the major reservoir sites in the basin.

Exploration work at the Kennett dam site was completed by the U. S. Engineering Department during the period. Three tunnels were driven with an aggregate length of 1450 feet. Additional exploration work was done at the Iron Canyon dam site. The exploration tunnel was extended 10 feet and another one at second test pit was dug to a depth of about 20 feet. Exploration work is under way in cooperation with the U. S. Bureau of Reclamation at the Table Mountain dam site.

Dr. David Weeks of the College of Agriculture, University of California, has submitted a preliminary draft of his report on the rate of development of agricultural lands in California. This report will be reviewed by a special committee appointed by Dean Hutchinson and will be transmitted by him to the State Engineer.

Sampling and testing of water at various stations on the American River have been continued throughout the period.

SAN JOAQUIN VALLEY INVESTIGATION

Studies of the irrigation yield to obtain with storage regulation were made during the period covering the following streams and reservoir sites:

San Joaquin River at Friant reservoir site.
Fresno River at Windy Gap reservoir site.
Chowchilla River at Buchanan reservoir site.
Merced River at Exchequer site.
Tuolumne River at Don Pedro site.
Stanislaus River at Melones site.

Seven million acres of foothill land from the Cosumnes River south to Merced County bordering the San Joaquin Valley have been examined. Of this total area a gross area of 1,400,000 acres has been classified as agricultural. This work has proceeded as far south as Merced County and is being continued into Mariposa and Madera counties. A map has been prepared showing the extent of the agricultural land in the San Joaquin Basin and the area now under irrigation development. These areas are being used in connection with the ground water investigation. The inter-seasonal water table fluctuations has been calculated and compiled for the entire period of record for the Upper San Joaquin Valley. Maps of this area delineating lines of equal depth to ground water as of October, 1929, are about three-fourths completed. Additional study of ground water storage capacity and the feasibility of replenishing same was made, taking into account the location of certain areas of nonabsorptive soils as revealed by field investigation and geological examination.

A revised study has been completed of month by month supply and draft for the stream basins of the Upper San Joaquin Valley, showing the total demand for water, the utilization of the local supplies, the requirement for imported water and net accumulation effect upon the ground water storage conditions for the 40-year period, 1889-1929, assuming complete irrigation development in that region.

Professor Frank Adams has submitted a preliminary draft on the "Permissible Cost of Irrigation Water in Southern San Joaquin Valley." This report was reviewed by representatives of the San Joaquin Valley Committee and others at a conference held in Visalia, September 20th. It is being reviewed at the present time by the College of Agriculture Committee. Upon its approval, the report will be transmitted by Dean Hutchinson to the State Engineer.

A report on the power phases of the coordinated plan of water development of the Sacramento and San Joaquin valleys with special reference to pumping water up the San Joaquin Valley has been completed by Mr. Lester S. Ready, Consulting Engineer, San Francisco. The following subjects are covered in the report:

1. Growth of power market.
2. Ability to absorb output of the various units of the coordinated plan.
3. Value of power from power plants to be built in connection with water storage development.
 - (a) Cost of power from other hydroelectric plants.
 - (b) Wholesale price of power as indicated by existing contracts.
 - (c) Cost of power from steam electric plants.
4. Power required for pumping water up San Joaquin River.
5. Cost of power for pumping purposes.

WATER RESOURCES

SALT WATER BARRIER INVESTIGATION

Work on the salt water barrier investigation during the past month has largely been concentrated on the gathering and compilation of basic data required for the computation and determination of water supply, storage and consumptive demand from the proposed barrier lake. This work has included completion of field surveys of the Suisun and San Pablo Bay marsh areas to determine the classification as to crops, natural vegetation and culture and the nature and extent of present development, and the office compilation of the results of these surveys. The consumption of water by industries in the upper Bay region was completely compiled from the detailed information already obtained with the questionnaires used in the industrial survey. Other water demands required by the operation of the barrier and detailed data on water supply and storage volumes were compiled. The rates of consumptive use of water by crops and natural vegetation and evaporation were determined for all of the consumptive areas in the delta and marsh areas of Suisun and San Pablo bays. This was included in a special study and report rendered by Charles H. Lee, consulting engineer, of San Francisco, with regard to evaporation and transpiration losses from natural vegetation and the final compilation by the U. S. Department of Agriculture of the results of six years of intensive measurements of duty of water in the delta of the Sacramento and San Joaquin rivers. Computations were completed on this study for each of the three barrier sites; namely, Chippis Island, Dillon Point and San Pablo Point. The deficiency in supply over the demand for each month and year for the present consumptive demands and the supplementary water required to meet these deficiencies were computed for each of these sites, assuming water supply available as during the past ten years.

Rapid progress has been made during the past month in the studies being carried on by the Industrial Economics Committee of the relation of the proposed salt water barrier to industrial development in the upper San Francisco Bay area. The committee, consisting of Professor W. E. Hotchkiss, Dean of the Stanford Graduate School of Business as chairman; Professor H. S. Grady, Dean of the Graduate School of Business of the University of California, and Mr. A. D. Schindler, consulting engineer, of San Francisco, have met twice during the past month, considering in detail the results of special studies being conducted by Professor George W. Bowrie, consulting economist from the Stanford Graduate School of Business. In this connection the office staff has completed detailed analyses of the consumption and cost of water used by the present industries in the upper Bay area.

Special reports on geology of the region in which the proposed salt water barrier sites are located, by Professor Tolman, consulting Geologist of Stanford University, and the studies of sewage pollution and industrial waste in relation to redemption of water supplies from the proposed salt water barrier lake, by Mr. C. G. Gillespie, sanitary engineer of the State Board of Health, are nearing completion and it is expected that the reports will be available next month.

SALINITY INVESTIGATION

Office work on salinity investigations during the past month has been concentrated on the preparation of plates and data for the salinity report and the final

computations on the relation of the advance and retreat of salinity to stream flow and tidal action, leading to the determination of supplemental stream flow required for control of salinity. The studies on the variation of salinity as related to stream flow and tidal action have included determination of the consumptive use of water in the delta of the Sacramento and San Joaquin rivers by crops, natural vegetation and evaporation. This work was practically completed, involving the determination of the relation of the advance of salinity for various degrees of salinity and at various points in the delta channels to the net effective stream flow. From these relations the control flows required for preventing the advance of salinity will be determined. Work on the preparation of the plates for illustrating the report about 85 per cent completed by the end of the month.

Field work has continued on the maintenance of between 50 and 40 regular salinity observation stations over the entire tidal basin from San Pablo Bay to the upper reaches of the delta, and, in addition, automatic tide gage stations throughout the tidal basin.

SOUTH COASTAL BASIN INVESTIGATION

Work of determining the capacity of underground basins was begun and arrangements were made for putting on a larger force for this work. A meeting was called by the Los Angeles County Conservation Association in Los Angeles on September 10th with a view to promoting the formation of a committee of laymen for cooperation with this office in the investigation.

MOJAVE RIVER INVESTIGATION

Routine work proceeded during the month. Plans were made for determining the evapo-transpiration losses in the various basins of the Mojave River. It appears that this information will be necessary before an intelligent report can be made. This work will be handled by the U. S. Geological Survey and the U. S. Department of Agriculture, Division of Agricultural Engineering.

VENTURA COUNTY INVESTIGATION

Aside from the ordinary routine procedure of the investigation, work was begun on a special investigation of a reservoir site on Piru Creek. A relocation of the State highway to take the place of the Ridge Route is projected down this creek and passes through the reservoir site. The object of the special investigation is to determine whether this is the best reservoir site on the creek and whether it is necessary to conservation of the water of the creek. A report will be made to the Director at an early date.

SANTA CLARA VALLEY AND NAPA COUNTY INVESTIGATIONS

Office work in connection with these two investigations is proceeding in anticipation of completing a progress report before the close of the year.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month.

MISCELLANEOUS INVESTIGATIONS AND ACTIVITIES

A report was completed on the work done to date in the investigation of the extent of and use of water on lands riparian to the Sacramento and American rivers and the extent of lands overflowed by these streams.

A regular inspection was made of the work being conducted in the Sacramento-San Joaquin Delta and in the Santa Ana Basin under the Cooperative Agreement with the U. S. Department of Agriculture, Divi-

sion of Agricultural Engineering, covering irrigation investigations.

HOOVER-YOUNG COMMISSION, LEGISLATIVE WATER COMMITTEE

The eighth meeting of the Joint Legislative Water Committee and the Hoover-Young Commission convened at Hotel Oakland, Oakland, on September 12 and 13, with all members of both bodies present.

Business was resumed after two months devoted to technical studies without formal hearings. The business transacted by both bodies to date was reviewed and rechecked.

Report of Mr. H. F. Ormsby was received and read covering transactions of the eleven Western States conference held at Salt Lake City during the month of June.

Lieutenant Colonel Robins, District Engineer, U. S. Engineers, reported on progress of the investigations under his direction.

Mr. E. W. Kramer, District Engineer, U. S. Department of Forestry, gave a verbal report on results of investigation of power rates, consumption and development.

Mr. C. A. Bissell, District Engineer, U. S. Reclamation Service, reported on the progress made in the investigation under his direction.

During the hearing State Engineer Edward Hyatt submitted technical data in connection with investigations of the state-wide plan and reviewed the activities of Division of Water Resources and its engineering advisory committees.

IRRIGATION, WATER STORAGE DISTRICTS AND BOND COMMISSION

Field work in connection with the assembling of data for the extension of Bulletin No. 21 has been completed, as also has the collection of data on the cost of water in California irrigation districts.

Office conferences have been held with representatives of the El Nido, Linden, El Dorado, Madera and Melano irrigation districts regarding the progress of these districts. A conference has also been held with proponents of the West Joaquin Irrigation District, an area of about 200,000 acres lying on the west side of the San Joaquin River and extending south from Crows Landing to Mendota. This area petitioned for organization in 1921 but failed to carry its organization plans to completion.

A petition was filed with the State Engineer requesting the exclusion of 319.2 acres of land from the Tulare Lake Basin Water Storage District, located in Kings County. Hearing on this petition has been set for October 14, 1930.

The California Bond Certification Commission has approved of the Linden Irrigation District proceeding with an election for a bond issue for the development of the district in amount of \$105,000. The California Bond Certification Commission has approved a rescission order on old work for the Woodbridge Irrigation District in amount of \$878 and authorized the district to expend this amount for new work which has recently been approved. The agreement between the Potter Valley Irrigation District and the Snow Mountain Water and Power Company covering the delivery of water to the district has been approved by the California Bond Certification Commission.

The horse took longer to get you there, but you didn't have to drive half-way back to hitch.—*Publishers Syndicate.*

DAMS

The activities of the Division have, during this period, been directed to completing a preliminary inspection of all dams now known to be under state jurisdiction, a study of the design of existing dams, a geological inspection of existing dams where deemed necessary, and constant supervision of dams under construction.

To date 700 applications have been filed for approval of existing dams; 46 applications for approval of plans for the construction or enlargement of dams, and 42 applications for approval of plans for repair or alteration of dams.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OR ENLARGEMENT

Dam	County	Owner	Estimated cost
Kramer*	Lassen	G. L. Kramer	\$2,000
Alta San Rafael*	Los Angeles	Alta San Rafael Company	13,600
La Grange**	Stanislaus	Turlock and Modesto Irrigation District	7,500
Porter**	Modoc	Pearl F. Porter	750
Whittier Reservoir No. 4	Los Angeles	City of Whittier	65,000

*Construction.
**Enlargement.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR REPAIRS OR ALTERATIONS

Sixteen such applications have been received during this period. The greatest number coming from Modoc County in response to the recommendations of our resident engineer in that locality.

PLANS APPROVED FOR CONSTRUCTION

Dam	Owner	County
Lake Madrone Dam	Geo. W. Mansfield & Duncan C. McCallum	Butte
Swanzy	Calif. & Hawaiian Sugar Refining Co.	Solano

PLANS APPROVED FOR REPAIRS OR ALTERATIONS

Eleven applications of this nature were approved by the State Engineer.

Order authorizing use of reservoir pending formal approval of the dam was issued to the city and county of San Francisco for the Moccasin Dam in Tuolumne County.

An office has been established in the Associated Realty Building in Los Angeles to take care of the eleven southern counties. The engineer in charge of this office, with the aid of an assistant, will supervise the construction of new dams. This will bring the department in closer contact with the southern part of the state and expedite decisions on various questions which arise on all construction jobs. They will also make an intensive study of all existing dams in that section with a view to issuance of certificates of approval at an early date.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued. Office work has included the preparation of mailing lists and mailing out of Bulletin No. 23 and the 1929 Annual Report and the preparation of maps of the irrigated areas under the diversions recorded.

In the field the engineers have begun the regular annual census of irrigated crops and areas and will be occupied on this for the major portion of the time up to November 1st.

The salinity investigation has been continued with the maintenance of six regular tide gage stations and sampling at 46 stations in the bay and delta area. The three tide gages which were installed temporarily in the vicinity of Courtland to secure data in connection with the proposed diversion of Sacramento River water through Snodgrass Slough have been discontinued as the desired data have been secured.

The following are comparative data for 1929 and 1930:

Salinity in parts of chlorine per 100,000

Station	Sept. 2, 1930	Sept. 2, 1929
Bullhead Point-----	1330	1340
O. & A. Ferry-----	800	720
Collinsville-----	570	680
Antioch-----	400	555
Jersey-----	160	365
Emmaton-----	146	255
Webb Pump-----	60	39
Rio Vista-----	20	67
Isleton-----	7	5

Discharge in second feet

Station	Sept. 2, 1930	Sept. 2, 1929
Sacramento River at Sacramento	3300	3200
San Joaquin River near Vernalis	1200	680
Combined Flow to Delta-----	4500	3880

SNOW SURVEYS

The last half of August was spent on office work in working up the data for Leevining and Rush Creek areas in the Mono Basin and Mammoth, Rock, Bishop, Big Pine and Cottonwood Creek areas in the Owens River Basin. The relation between snow survey and precipitation measurements and run-off for the few years that snow surveys have been made was determined and the actual run-off compared with what would have been the forecasts. This study indicated certain improvements in the work which might be made in the way of additional snow courses, etc., and in the first half of September, a field trip was made to go over the work with and suggest these improvements to the cooperating agencies, the Southern Sierras Power Company and city of Los Angeles. On the same trip the plans were perfected for the coming season's surveys in these two basins and in the Kings and Kern River Basins as well. The equipment used has been overhauled and is being redistributed.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

Twenty-eight applications to appropriate water were received during the month of August, 16 applications were canceled and 17 were approved; 4 licenses were issued.

Applications received during the month which were of more than ordinary interest are those from the city of Fresno seeking appropriations from the San Joaquin River for municipal water supply, irrigation, and power purposes at an estimated cost of \$1,000,000; and the application by R. D. Owen to appropriate from Arrowhead Lake, Mono County for power purposes, estimated cost \$50,000.

Among the permits issued was one to the Montague

Water Conservation District allowing an appropriation from Inconstance Creek, Siskiyou County for irrigation purposes, the estimated cost of the project being \$200,000.

ADJUDICATIONS

Shasta River (Siskiyou County): Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties): Still pending in the Superior Court of Riverside County awaiting development in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County): Submission of referee's final report still being withheld pending negotiations now in progress towards settlement of one of the important issues.

Oak Run Creek (Shasta County): Case still pending in Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Choror Creek (Shasta County): Case still pending in the Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County): Case still pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County): Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County): Negotiations relative to a consent judgment still being carried on.

Mill Creek (Modoc County): The trial schedule of distribution proposed by the Division of Water Resources was administered by a water master throughout the month.

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

Franklin Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

WATER DISTRIBUTION

Little Shasta River and Lower Shasta River (Siskiyou County), *Hat, Burney, North Cow, Oak Run and Choror creeks* (Shasta County), *Davis, Emerson, Mill, Owl and Soldier creeks* (Modoc County) and *West Fork of Carson River* (Alpine County). Water master service on these streams was continued throughout the month.

Pit River (Modoc and Lassen counties). Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River investigation. The flow of the stream has receded to a point where only sufficient water is available for stock watering purposes.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The irrigation of willows planted for levee protection along the Sutter By-pass has been discontinued for the season. Routine maintenance work has been carried on and some clearing of second growth timber in the by-pass has been done. An average of twenty-five men have been engaged in this work during the period. The project in Sutter County is now in good order for the winter season.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

The Ritchie contract for constructing pavement levee protection at Isleton was completed on August 28, 1930, at a total cost of \$7,250.

Two current retards have been completed on the Davis property on the Sacramento River eleven miles above Colusa, in cooperation with Reclamation District No. 2047, at a cost of \$6,200.

Three current retards have been completed on the Campbell and Dwyer ranch two miles below Colusa, and one current retard has been completed on the Cecil ranch four miles below Colusa, in cooperation with the Sacramento River West Side Levee District, at a total cost of \$10,600.

The bank protection repair work for Reclamation District No. 535 at Oak Hall Bend on the Sacramento River has been completed, with the placing of 600 tons of quarry rock.

Arrangements have been made to install two tree current retards on the left bank of the Sacramento River at Twenty-Mile Bend two miles below Meridian, in cooperation with Reclamation District No. 70 at a cost of \$4,100, work to start immediately. About 500 additional tons of quarry rock will be deposited on the Brannan Island protection, in cooperation with Reclamation District No. 2067. Work is being commenced at once on bank protection work on Twitchell Island, Andrus Island, and in the San Joaquin River at Tom Paine Slough.

SACRAMENTO FLOOD CONTROL PROJECT

An average of sixty-five men have been engaged during the period in clearing in the Sutter By-pass and two camps have been in operation. The clearing work in the Feather River bottoms near Marysville under five contracts is 95 per cent complete.

Surveys have been completed for the Bow levee at Nelson Bend, a unit of the flood control construction program, and the surveys of the areas cleared and to be cleared in the by-passes have continued. Considerable work has been done in connection with right of way matters relating to the new levees in the flood control construction program and in making arrangements for the work to proceed on the various construction units proposed.

The Deputy in Charge of Flood Control and Reclamation attended one meeting of the Reclamation Board and one meeting of the construction committee of the flood control association.

SANTA MARIA RIVER

A project for clearing the channel of the Santa Maria River of timber and brush near Guadalupe has been undertaken by this department in cooperation with Santa Barbara County for the purpose of rectifying the channel and providing a clear passage for flood waters.

The channel will be cleared for a length of six miles to a width of approximately 400 feet at a cost of \$6,000, of which the state will contribute \$2,000. It is expected that additional funds will be provided by other local interests to bring the total sum available up to at least \$10,000. The work will be done by day labor.

RUSSIAN RIVER JETTY

Eight men have been engaged in operating the railroad and quarry, depositing rock in the Russian River jetty. This work will continue for two months. The channel has remained open.

NAVARRO RIVER JETTY

It is expected that the rock jetty on the Navarro River, which is being constructed under contract by

Christie and Allen, will be completed by October 15, 1930. This work is being done for the Division of Fish and Game.

SEPTEMBER REPORT OF DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

STUDY IS MADE OF MOTOR VEHICLE ACCIDENTS

A research study on the hours of occurrence of motor vehicle accidents was made by the Bureau of Research, Statistics and Traffic Safety during the month. This study revealed that during the period of 3 p.m. and 9 p.m. daily, there is a continuing condition existing resulting in a maximum of accidents. The study brought out that from 68 per cent to 70 per cent of all motor vehicle accidents occur in or close to large municipalities.

Based on this study, an "ideal" traffic patrol schedule was worked out. This schedule differs from schedules now employed in many cities, although most large police departments approximate it. The study was submitted to the police chiefs of various cities for the purpose of informing them accurately upon the exact periods of peak traffic congestion. Many chiefs were surprised to learn the extent of the period and did not realize that maximum strength patrol should be continued up to as late as 9 p.m. This study was received with much appreciation and several chiefs have written their thanks to the Bureau. Dozens of highly complimentary letters have been received by the Bureau from persons in California and other states who have received the revised monthly statistical summary. These letters indicate that the Division has succeeded in presenting accident figures in a more simple and more readable form.

HIGHWAY PATROL ACTIVITIES

During the past month the Head of the Bureau of Traffic Enforcement has devoted his time chiefly to inspection work. During the month the officers and men in the Patrol drove 843,027 miles. During the State Fair a detail of 14 men were assigned to duties of directing traffic at the Fair Grounds.

Every county squad has increased their enforcement of light regulations during the past month. While August figures have not as yet been completed, we expect to show a considerable increase in the work over previous months. During August four new signals and six light devices were submitted to the Bureau for tests.

The Bureau of Brakes and Commercial Vehicles have continued their program of inspection and have received new equipment for the transportation of the equipment used in making brake tests which will make it possible to increase the number of brakes tested in all districts of the state.

So far this year 1549 applications have been received for official brake testing stations, of which 1077 have been approved. There are at present 2410 authorized adjusters. During the month 2010 trucks were tested, 1095 warned and 498 drivers of trucks were arrested.

OPERATORS' LICENSES

During the past month 32,753 operators' licenses were issued by the Division. This number is approximately 10 per cent less than in July.

COMPARATIVE FIGURES

The following comparative figures are as of September 1, 1930, as compared with September 1, 1929.

	1930	Increase or decrease as compared with 1929
Motor vehicle registrations	2,033,166	93,620 Increase
Automobile, truck and trailer dealers registrations	3,184	136 Decrease
Transfers	376,900	64,956 Decrease
Chauffeur's licenses	135,062	5,517 Increase
*Nonresident permits	56,886	5,969 Increase

*Figures cover first seven months of 1930 and 1929.

SEPTEMBER REPORT OF DIVISION OF ARCHITECTURE

GEO. McDONOUGH, Chief

During September, contracts were awarded upon projects at the San Diego State Teachers College and the Preston School of Industry. These projects show a value of \$67,441.

ROAD ENGINEERS FROM ALL PARTS OF WORLD MEET AT WASHINGTON

(Continued from page 22.)

As we turn to Continental Europe, every country has its engineers here. Great Britain has close to 100 of its leading highway administrators and men interested in highway transport as its representatives; France has some 50 men, Italy 30, Germany an equal number.

Czechoslovakia, Bulgaria, Greece, Belgium, The Netherlands and the Scandinavian countries with Poland and Yugoslavia are here with picked representatives, and so the list goes.

From them, we will hear the story of trails flung across the Arctic Circle, of roads built in the time of the Roman Empire, and through the days of Napoleon, now brought back into new service for modern-day traffic.

With them, we will discuss the problem of providing roads for new countries, of ways and means of finance, of accelerating the constantly increasing highway traffic in the congested areas of the great cities, whether it be London or Paris, Berlin, Brussels, Madrid, Shanghai, Tokio, Bagdad or Bombay.

The essential task of fitting highway transport into the jig-saw puzzle of other forms of transportation, rail, water and air, so as to establish a uniform, continuous and economic whole, will receive its due share of attention from the delegates.

UNIVERSAL SIGNALS PLANNED

With them we will discuss the development of common rules of the road, in order that the man who drives an automobile, whether he be in Palestine or Siberia, Malaya or Detroit, whether he speaks Japanese or Arabic, Italian or any other tongue, may know that the signs and signals mean the same thing so that he may proceed with safety. The aim is universal traffic signals, intelligible to all the world.

In this conference, we may speak a variety of tongues, but we have a great universal language—the language of the road.

Cliff Dwellers Are Found on Route of Proposed Highway

Two modern cliff dwellers, legal residents of Ventura County, were discovered inhabiting a hollow rock in a secluded settlement in the Santa Susana mountain section by the county officials while inspecting the route of a proposed highway in the Simi Valley.

High and dry in their rocky abode, the man and woman, who remain unidentified, have laid a cement floor, built a protecting wall over the large hole in the hard sandstone formation, and made two rooms of the enclosure by erecting a partition in the middle.

The wife, young and good looking, keeps "house," while her husband works as a garage mechanic near by at Chatsworth.

One of the rooms, into which the only door leads, is a combination kitchen and living room. The other is the bedroom. A stove-pipe leads from the stove to the point where the wooden partition joins the rock at the top, and wootens along up the face of the gigantic rock.

LAUGH

Build for yourself a strong box,

Fashion each part with care;

Fit it with hasp and padlock,

Put all your troubles there.

Hide therein all your failures,

And each bitter cup you quaff,

Look all your heartaches within it

Then sit on the lid and laugh.

Tell no one of its contents,

Never its secrets share;

Drop in your cares and worries,

Keep them forever there.

Hide them from sight so completely

The world will never dream half,

Fasten the top down securely

Then sit on the lid and laugh.—*Exchange.*

OREGON—Motorists in this state are protected in the use of drinking water by drinking fountains, artistically designed to conform with their surroundings, erected by the Oregon State Highway Commission, with signs announcing them 300 feet in each direction.

MEXICO—A new international highway to extend from Parel, Chihuahua, Mexico, to Ensenada, Lower California, Mexico, and connecting at Parel with a highway to Juarez, Mexico, opposite El Paso, has been announced by the Mexican Government. Work is already in progress on the first 60-mile unit south from Juarez.

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON SEPTEMBER 24th

C. H. PURCELL, Chief of Division of Highways.

PROJECTS COMPLETED

Contracts completed from August 21st to September 22d include the following:

WORK IN IMPERIAL COUNTY

Two contracts for placing Portland cement concrete pavement, 20 feet wide, in the Imperial Valley have been accepted.

One was on a portion of the interstate highway which extends between Yuma, Arizona, and San Diego and Los Angeles. The work was done over that part of the road from El Centro to Holtville, a distance of 9 miles, and included the construction of wide side ditches and raising the grade of the highway to eliminate flooding of the road from irrigation overflow.

The other contract was on the main highway between El Centro and Los Angeles via San Bernardino. The 10.4 miles between Brawley and 4 miles west of Westmorland were included in the improvement. This project completes the concrete pavement between El Centro and San Bernardino making a more adequate roadway for the heavy produce trucking which this artery between the fertile Imperial Valley and metropolitan Los Angeles is called upon to carry.

These two improvements in Imperial County were completed at a cost of \$647,200.

FOOTHILL BOULEVARD

An important improvement on the Foothill Boulevard between Los Angeles and San Bernardino is completed by the widening of the reinforced concrete girder bridge across the San Gabriel River near Azusa. This 1000-foot structure was widened to a clear roadway width of 42 feet, thereby relieving the "bottleneck" which had been formed at this point by the widening to 40 feet of the pavement on both sides of the old narrow bridge. The cost of this widening amounted to \$92,500.

CREST DRIVE

Nearly two miles of the scenic Crest Drive in the mountains just to the north of San Bernardino have just been graded on a new alignment at a cost of \$111,500. This portion extends from the pass, between Waterman Canyon and Devils Canyon, down Waterman Canyon. Bids were opened this month for oiling both this section and that section from Running Springs to Squirrel Inn of this popular recreational highway. The grading just completed has brought to modern standards of mountain highway construction the worst section of the road from San Bernardino to Big Bear Lake.

WORK AT BEACHES

In Orange County, the Portland cement concrete pavement on the heavily traveled Coast Boulevard has been widened from 20 feet to 30 feet between Sunset Beach and Newport Beach, and the roadbed widened to the full width of the right of way. The unusually wide roadbed is designed to give much needed parking space for the traffic using this road through the southern California beaches. A similar project is just starting between Seal Beach and Sunset Beach, and also construction on a new alignment of that portion of the route from Long Beach to Seal Beach. The improvement just completed cost \$215,800.

VENTURA BOULEVARD

On Ventura Boulevard in Los Angeles County, the old Liberty Grade has been straightened and given a much easier grade. This roadbed and pavement relocation and construction is located about five miles north of Calabasas on the Los Angeles to San Francisco Coast Route. The cost was \$78,400 and covered a distance of 1.2 miles.

MOJAVE HIGHWAY PROJECT

The steady improvement of the Mojave to Bishop Highway is noted by the completion of the 3.7 miles in Inyo County between Little Lake and Coso Junction. Costing \$88,200, this road has been graded to the standard 36-foot roadbed and surfaced with 20 feet of oil treated rock on crusher run base. This section of desert road through the Owens Valley is closely paralleled by the Owens branch of the Southern Pacific and the Los Angeles Aqueduct. In order to build the highway at Little Lake, it was necessary for the state to relocate and construct the railroad's roadbed for a short distance.

COAST ROUTE BETTERMENTS

Nearly ten miles of the Coast Route between Los Angeles and San Francisco have been reconstructed from Atascadero to Paso Robles. The work, costing \$296,200, consisted of straightening, leveling and widening the old road. A standard 20-foot asphalt concrete pavement with 8-foot shoulders has replaced the old 15-foot Portland cement concrete pavement, bringing another stretch of this important arterial to the standards of a modern high-speed highway.

Costing \$244,800, one of the largest bridges on the Coast Route has just been erected across the Salinas River at San Ardo in Monterey County. The old bridge, which was only 15 feet wide, was built by the county in 1907 and had become dangerous for the loads and traffic it was called upon to carry. The new structure consists of ten 100-foot steel deck truss spans and seventeen 37-foot reinforced concrete girder spans.

REDWOOD HIGHWAY WORK

The progress of the construction of the Redwood Highway on the new alignment from Sausalito to San Rafael in Marin County is noted by the completion of the overhead crossing across the tracks of the Northwestern Pacific Railroad at California Park, just to the south of San Rafael. This structure consists of one 150-foot steel truss span on concrete piers, one 41-foot and one 28-foot steel beam spans on structural steel bents and 686 feet of timber trestle on pile and frame bents, providing a clear roadway width of 44 feet, 8 inches. The grading on the section of this new routing of the popular Redwood Highway from Alto to San Rafael was completed some two months ago and the surfacing is now being placed so that by the time of the completion of the grade separation and bridge now under construction, this section will be ready for use by the public.

MOTHER LODE PROJECTS

The improvement of the Mother Lode Highway, which extends through the heart of the mining district of California's early history, is always a matter of widespread interest. The section of this all-year mountain road in Calaveras County for a mile and a half north and south of Calaveritas Creek has just been graded and surfaced with oil treated crushed rock, and a reinforced concrete girder bridge 240 feet long has been built across Calaveritas Creek. This portion of the old, narrow and crooked road with its many sharp breaks in grade has been replaced by a modern mountain highway with large radius curves and easy grades. The road construction and bridge cost \$71,100.

VICTORY HIGHWAY

In Placer and Nevada counties, the grading of the new alignment of the Sacramento to Reno highway over the 10.5 miles from Indian Springs to Soda Springs has just been completed. The placing of untreated crushed rock surfacing over this and the adjoining section from Emigrant Gap to Yuba Pass is now under way. This improvement, the grading portion of which cost \$303,000, will be greatly appreciated by the thousands of tourists using this route to Lake Tahoe and other mountain resorts.

PACIFIC HIGHWAY

A small improvement, but one of importance in closing a gap in the pavement, has been completed through Wheatland in Yuba County. This work was a realignment of a portion of the Pacific Highway between Sacramento and the Oregon line. The new alignment has, by diagonal routing, eliminated the right angle turns in approaching and passing through the town. A standard 20-foot Portland cement concrete pavement on a 36-foot roadbed was constructed at a cost of \$37,300. A similar project on this route is now under way at Lincoln in Placer County which will complete the pavement between Sacramento and Red Bluff.

CONSTRUCTION BIDS

Bids on construction opened during the same period include the following:

CASTAIC BRIDGE

In Los Angeles County, a reinforced concrete girder bridge, composed of seven 35-foot spans on concrete pile bents and concrete abutments with pile foundations and having a roadway width of 34 feet, is to be

built across Castaic Creek on the Los Angeles-Sacramento artery south of the Ridge Route. This new structure will be built on a new alignment at this crossing of Castaic Creek and will replace the existing 8-span through girder bridge which was built by the county some 15 years ago on an inferior line. Bids for construction of the approaches were opened on October 1, 1930.

BAY SHORE HIGHWAY

Rapid construction of the Bay Shore Highway is evidenced by the succession of projects which have been started under way in the past few months. Bids were opened on September 3d for the construction of a 60-foot graded roadbed over the four miles from Redwood City to Willow Road in San Mateo County. This will mark another stride in carrying this important alternate route down the peninsula from San Francisco to San Jose. The termination of this project is Willow Road, which is the main connection between the Coast Route and the Dumbarton Bridge across the lower arm of the bay. In conjunction with the construction of this portion of this route will be the building of a subway under the tracks of the Southern Pacific Railroad's Dumbarton cutoff. This structure, however, will be built under a separate contract.

Two more projects on this route have also been advertised during the past four weeks. One calls for the paving with Portland cement concrete 40 feet wide from the northerly city limits of South San Francisco to the underpass under the Southern Pacific's main line tracks in South San Francisco, and the other will be the placing of a bituminous treated surface 42 feet wide on the recently constructed graded roadbed between San Mateo and Redwood City. This last project will give a graded and surfaced highway over the 20 miles from San Bruno avenue in San Francisco to Redwood City.

The total cost of these three projects will be approximately \$320,000.

MOTHER LODE BIDS

The further improvement of the Mother Lode Highway is noted by the opening of bids for the construction of the 4.3 miles from Amador City to Martell in Amador County. This improvement will connect with the recently constructed section from Drytown to Amador City and will pass through the interesting old mining town of Sutter Creek. The roadbed will be 24 feet wide and will be surfaced with 20 feet of untreated crushed gravel or stone. This rapid development of the Mother Lode Highway is opening to the tourist an all-year mountain road through a country rich in relics of early California history.

County Reports on State Highway Projects

COLUSA COUNTY

Grading of 13 miles of new state highway, between Bear Creek and five miles west of Williams, on the Ukiah-Tahoe Highway under contract by R. G. Le Tourneau, is progressing very satisfactorily. E. L. Evans is resident engineer in charge of the work, which is about 35 per cent complete.

Grading of 39-foot roadbed between Williams and Maxwell, under contract by Fredrickson-Watson Con-

struction Co., is progressing favorably. C. F. Woodin is resident engineer in charge of the work, which is about 82 per cent complete.

Proposals will be received September 24 for constructing a gravel subbase for ultimate Portland cement concrete between the above limits.

Proposals will be received October 1 for construction of property fence between Bear Creek and 8 miles west of Williams.

EL DORADO COUNTY

Construction of a new roadbed between Bay View Rest and one mile north of Eagle Falls is under contract by Nate Lovelace. The mountainous country through which the route is projected necessitates a large volume of roadbed retaining wall. The wall is being constructed of selected material obtained along the work. W. G. Timney is resident engineer in charge of the work, which is about 82 per cent complete. It is expected that the contract will be finished this year.

A contract for applying 6.2 miles of bituminous surface treatment between Fresh Pond and 3 miles east of Riverton was awarded to F. C. Adams of Angels Camp on August 19, 1930. The contractor is assembling a rock crushing plant at a local gravel pit, and expects to begin applying the treatment in a few days. J. G. Meyers has been appointed resident engineer.

Proposals were received September 24 for grading and surfacing 1.7 miles between Clark's Corner and Placerville. The work includes the construction of a reinforced concrete bridge across Hangtown Creek. The new construction will be over new right of way, using latest standard grade and alignment.

GLENN COUNTY

The concrete paving project between Logandale and Willows, under contract by Basich Bros. Construction Co., was begun the latter part of May. The pavement has been completed and very good performance for this type of work was obtained. The contractor laid 11,465 cubic yards of concrete in 28 days. The average daily output was about 417 cubic yards. The maximum amount placed a day was 450 cubic yards.

Very good test reports from the laboratory have been received and the finished surface is up to the standard for smoothness. E. J. L. Peterson is resident engineer in charge of the work, which is about 92 per cent complete.

LAKE COUNTY

From Abbott Mine to Bear Creek, Colusa County, the construction of a new 24-foot graded roadbed is one-third finished. Work is on schedule, and, at the present rate of progress, will be completed by the early part of next year. E. L. Evans is resident engineer in charge of the work.

MONTEREY COUNTY

The bridge across the Salinas River at San Ardo is complete. Ben C. Gerwick was the Contractor under the supervision of the Bridge Department.

Progress is being made on the bridge across the Salinas River at Bradley. H. E. Doering is the Contractor under the supervision of the Bridge Department.

The timber bridge across Alder Creek on the San Simeon-Carmel Highway has been completed. The Dean Construction Co. was the Contractor under the supervision of the Bridge Department.

Two convict camps are maintained on the San Simeon-Carmel Highway. Camp No. 22 at Willow Creek has a crew of eighty men, and Camp No. 18 at Little Sur has a crew of sixty men.

The new camp at Willow Creek is being beautified by convicts in their spare time, and is already one of the most attractive camps in the state. Free men's

quarters have been provided at Spruce Creek about three miles south of Willow Creek. Surveys and plans are in progress for extending the work of both camps.

PLACER COUNTY

Contractor N. M. Ball began grading and paving with Portland cement concrete through the town of Lincoln on August 13, 1930. A 36 to 50-foot grade, carrying a 20-foot pavement on improved alignment, will replace the present narrow 15-foot pavement. J. D. Greene is resident engineer and reports the work about 10 per cent complete. The anticipated date of completion is December 24, 1930.

A. Teichert and Son on September 10 completed the applying of a bituminous surface treatment between Roseville and Rocklin, under the supervision of Resident Engineer J. G. Meyers.

Construction began September 2, 1930, by the T. M. Morgan Paving Co. for the grading of a 36- and 48-foot roadbed and the driving of a highway tunnel that will eliminate from the highway system the present steep grade and crooked routing through the town Newcastle. Under this contract, the roadbed will be surfaced with oil treated crushed gravel or stone, and is designed to serve as a temporary traffic surface and as a base for the prepared Portland cement pavement that will be placed in the near future. James Trask has been appointed resident engineer. Work will be completed in May, 1931.

PLACER AND NEVADA COUNTIES

Grading of about 93 miles of highway between Airport and Indian Springs, a part of the Dutch Flat-Donner Lake wagon road, by T. E. Connolly, is being completed as rapidly as possible to permit the placing of crushed stone surfacing, which will be placed by Tieslau Bros. on the entire length of the new grade. R. A. Burns is resident engineer in charge of the work.

SAN BENITO COUNTY

Surveys are nearly complete for the elimination of the San Juan Grade between Salinas and the San Benito River. This line has been located in a position that will preserve the natural beauty of Pineate Rocks, along the route. The project is located in San Benito and Monterey counties.

SAN LUIS OBISPO COUNTY

Work is complete on the reconstruction of the Coast Highway between the Santa Maria River and Los Berros Creek. This is a 20-foot Portland cement concrete pavement on a 36-foot roadbed. J. F. Knapp was the Contractor.

Bids were received on October 8th for the construction of a 20-foot concrete pavement across the bed of the Santa Maria River. This is a dry weather detour around the through steel truss bridge, one span of which collapsed on June 10, 1930. The wrecked span will be replaced by a temporary trestle to carry traffic during high water.

On the Coast Highway, between San Luis Obispo and Cuesta Grade, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. The Cornwall Construction Company is Contractor.

On the Cholame lateral, between the Sacramento Ranch and the Kern County line, a seal coat is being applied to the existing bituminous macadam. Fred Nightbert is the Contractor.

Plans have been prepared for the reconstruction of the Coast Highway between Paso Robles and the

Monterey County line, a distance of about ten miles.

Surveys are in progress for the reconstruction of the portion of the Carmel-San Simeon Highway from San Simeon to Cambria.

SANTA BARBARA COUNTY

Progress is being made on a reinforced concrete bridge across Nojoqui Creek on the Coast Highway. This is located about 1½ miles south of Buellton. Silveria and Robbins are the contractors under the supervision of the Bridge Department.

On the Cuyama lateral from the second crossing of the Cuyama River to the Kern County line, a distance of about thirty-eight miles, the road is being surfaced with crusher run base and oiled rock surface, twenty feet in width. The Lang Transportation Company is Contractor. A portion of this project is located in San Luis Obispo County.

Work is complete on the reconstruction of the Coast Highway between Zaca and Wigmore. The Cornwall Construction Co. was the Contractor.

YOLO COUNTY

Construction is in progress for grading and paving with asphalt concrete 5.8 miles of state highway between Bretona and Dunnigan. F. R. Baker is resident engineer.

YUBA COUNTY

A 20-foot Portland cement concrete pavement through Wheatland has been completed by C. W. Wood, the contractor. J. D. Green was resident engineer in charge of the work.

LIST OF HIGHWAY BIDS AND AWARDS

For September

BUTTE COUNTY—Between north city limits, Chico, and northerly county boundary, 5 miles pit run gravel borders. Dist. III, Rt. 3, Sec. D. Hemstreet & Bell, Marysville, \$6,000; Chas. A. Howard, Richmond, \$5,910; F. J. Chesson, Yuba City, \$6,000. Contract awarded to C. Mankel, Sacramento, \$4,470.

COLUSA COUNTY—Between Williams and Maxwell, 8.1 miles to be surfaced with a gravel base. Dist. III, Rt. 7, Sec. C. Basich Bros. Const. Co., Torrance, \$111,470; Fredrickson-Watson Const. Co., & Fredrickson Bros., Oakland, \$127,800; Lilly, Willard & Biasotti, Stockton, \$130,640; Clyde W. Wood, Stockton, \$113,600; J. C. Compton, McMinnville, Oregon, \$120,700; V. R. Dennis Const. Co., San Diego, \$102,240; A. Teichert & Son, Inc., Sacramento, \$130,460; C. Mankel, Sacramento, \$121,410; Hemstreet & Bell, Marysville, \$122,120; A. Frederick Anderson, Oakland, \$119,990. Contract awarded to D. McDonald, Sacramento, \$95,140.

COLUSA COUNTY—Between 1 mile south of Arbuckle and Geneva, 5 miles of pit run gravel borders. Dist. III, Rt. 7, Sec. A. Pereira & Reed, Tracy, \$6,180; A. Teichert & Son, Inc., Sacramento, \$6,720; Harms Bros., Galt, \$4,950; Hemstreet & Bell, Marysville, \$9,000; C. Mankel, Sacramento, \$5,580; Chas. A. Howard, Richmond, \$7,590; J. R. Reeves,

Sacramento, \$7,320; F. J. Chesson, Yuba City, \$5,130. Contract awarded to H. Sykes, Paterson, \$4,650.

EL DORADO COUNTY—Between Clark's corner and Placerville, about 1.7 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. III, Rt. 11, Section C. W. H. Hanser, Oakland, \$94,512; Clark & Henery Const. Co., San Francisco, \$105,827; Contoules Const. Co., San Francisco, \$105,985; Larsen Bros., Galt, \$105,156; E. C. Coats, Sacramento, \$84,405; Granfield, Farrar & Carlin, San Francisco, \$100,171; Chlaris & Sutsos, San Francisco, \$92,463; George Polock Co., Sacramento, \$96,216; A. Teichert & Son, Inc., Sacramento, \$99,823; Adams Const. Co., Angels Camp, \$92,252; Finnell Co., Inc., Sacramento, \$120,302; J. M. De Luca, Oakland, \$104,551; Hemstreet & Bell, Marysville, \$90,825; Kern & Kibbe, San Francisco, \$98,403. Contract awarded to C. Emil Force, Piedmont, \$83,909.

LOS ANGELES COUNTY—Between Tunnel Station and Santa Clara River Bridge, 8.6 miles, heavy fuel oil to be furnished and applied to shoulders. Dist. VII, Rt. 4, Sec. F. Orange County Refining Co., Los Angeles, \$5,233; Square Oil Co., Inc., Los Angeles, \$5,348; Calif. Road Oil Service Co., Wilmington, \$5,462; Leonard C. Pulley, Long Beach, \$5,615; Gilmore Oil Co., Ltd., Los Angeles, \$61,112. Contract awarded to G. M. Duntley, Los Angeles, \$4,469.

LOS ANGELES COUNTY—Reinforced girder bridge across Castaic Creek about one-half mile north of Castaic Junction consisting of seven 35-foot spans on concrete pile bents and concrete abutments with pile foudns. Dist. VII, Rt. 4, Sec. A. M. H. Slocum, Pasadena, \$36,219; George J. Ulrich Const. Co., Modesto, \$35,695; Gist & Bell, Arcadia, \$35,800; R. R. Bishop, Long Beach, \$37,700; Byerts & Dunn, Los Angeles, \$38,643; R. H. Travers, Los Angeles, \$32,847; Oberg Bros., Los Angeles, \$32,166; A. R. Bodenhamer, Carpinteria, \$34,841. Contract awarded to Carpenters Bros., Inc., Beverly Hills, \$31,149.

MENDOCINO COUNTY—Erection and completion of a maintenance station at Ukiah. Dist. IV, Rt. 1, Sec. C. Chas. Swanfelt, Ukiah, \$14,554; McCarthy-Johannus, San Francisco, \$13,248; Crawford & Baker, Ukiah, \$16,781; Chas. W. Gibson, Ukiah, \$13,564; Spivock & Spivock, San Francisco, \$18,400; J. W. Cobby & Son, San Francisco, \$13,453. Contract awarded to Louis Halvorsen, Santa Rosa, \$13,166.

TRINITY COUNTY—Between westerly boundary and Burnt Ranch, about 0.8 mile to be graded. Dist. I, Rt. 20, Sec. C. W. C. Colley, Berkeley, \$36,774; Contoules Const. Co., San Francisco, \$44,098; Engelhart Paving & Const. Co., Eureka, \$37,980; Chigris & Sutsos, San Francisco, \$35,996; Finnell Co., Inc., Sacramento, \$59,800; Hemstreet & Bell, Marysville, \$32,017; J. M. De Luca, Oakland, \$43,070. Contract awarded to H. H. Boomer, San Francisco, \$31,476.

YOLO COUNTY—Between Cache Creek and Zamora, 5.9 miles of pit run gravel borders. Dist. III, Rt. 7, Sec. B. Pereira & Reed, Tracy, \$5,678; A. Teichert & Son, Inc., Sacramento, \$6,596; Hemstreet & Bell, Marysville, \$7,820; Chas. A. Howard, Richmond, \$5,610; C. Mankel, Sacramento, \$5,168; Chief Const. Co., Oakland, \$7,990; F. J. Chesson, Yuba City, \$4,624; J. R. Reeves, Sacramento, \$5,236; Leroy Kerr, Yolo, \$4,488. Contract awarded to Harms Bros., Galt, \$4,216.

Butler: "Sir, your wife has eloped in the car with the chauffeur!"

Doctor: "Dammit! Where will I find another like her; why I used to get twenty miles to the gallon out of the old crate."—Exchange.

ARCHITECTURAL AWARDS

For September

SAN DIEGO STATE TEACHERS COLLEGE—Contract for Electrical Service awarded to Electric Company of Los Angeles for \$8,844.

Contract for Service Connection awarded to W. H. Robinson of Los Angeles, \$25,676.

PRESTON SCHOOL OF INDUSTRY, Ione—Contract for General Work for Domestic Water Supply, awarded to Guth and Fox of Sacramento for \$8,376.

PACIFIC COLONY, Spadra—Contract for installation of Water Tube Boiler and Accessories, awarded to R. G. Meyler Corporation of Los Angeles for \$12,230.

WHITTIER STATE SCHOOL—Contract for installation of Water Tube Boiler and Accessories, awarded to R. G. Meyler Corporation of Los Angeles for \$13,170.

Correction—It was announced in the last issue that R. R. Jones Electric Company of South Pasadena was awarded contract for electrical work on the Kitchen and Commissary Buildings. This award has been made to the American Electric Construction Company of Los Angeles for \$2,714.

WATER APPLICATIONS AND PERMITS

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of September, 1930.

BUTTE COUNTY—Permit 3554, Application 6232. Issued to Division of Highways, Sacramento, September 5, 1930, for 0.025 c.f.s. from 2 unnamed springs in Sec. 24, T. 20 N., R. 4 E., M. D. M., for domestic purposes. Estimated cost \$150.

BUTTE COUNTY—Permit 3555, Application 6234. Issued to Division of Highways, Sacramento, September 5, 1930, for 0.025 c.f.s. from Cherokee Creek in Sec. 10, T. 19 N., R. 4 E., M. D. M., for domestic purposes. Estimated cost \$300.

LOS ANGELES COUNTY—Permit 3556, Application 6625. Issued to Geo. H. Lettau, Los Angeles, September 5, 1930, for 0.29 c.f.s. from seven unnamed springs, 1, 2, 3, 4, 5, 7 in Sec. 31, T. 6 N., R. 13 W., No. 6 in Sec. 1, T. 5 N., R. 14 W., S. B. M., for irrigation and domestic on 230 acres.

MONO COUNTY—Permit 3557, Application 6278. Issued to A. J. Warrington, Bridgeport, September 6, 1930, for 3 c.f.s. from Dog Creek in Sec. 16, T. 3 N., R. 25 E., M. D. M., for mining purposes. Estimated cost \$1,500.

SUTTER COUNTY—Permit 3558, Application 6248. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 12.82 c.f.s. from East dredge cut of Sutter By-pass in Sec. 3, T. 12 N., R. 3 E., M. D. M., for irrigation on 725.67 acres. Estimated cost \$6,800.

SUTTER COUNTY—Permit 3559, Application 6531. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 10 c.f.s. from East dredge cut Sutter By-pass in Sec. 19, T. 13 N., R. 3 E., and Sec. 3, T. 12 N., R. 3 E., M. D. M., for duck ponds.

SUTTER COUNTY—Permit 3560, Application 6582. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 47.26 c.f.s. from East dredge cut of Sutter By-pass in Sec. 19, T. 13 N., R. 3 E., and Sec. 3, T. 12 N., R. 3 E., M. D. M., for irrigation on 1897.65 acres. Estimated cost \$15,000.

SIERRA COUNTY—Permit 3561, Application 6306.

Issued to G. de Bretteville, Venice, September 11, 1930, for 3 c.f.s. from 6 unnamed springs in Secs. 26 and 27, T. 21 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$250.

MONO COUNTY—Permit 3562, Application 6674. Issued to L. L. Alauzet, Los Angeles, September 15, 1930, for 200 g.p.d. from Rock Creek in Sec. 23, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$250.

SAN JOAQUIN COUNTY—Permit 3563, Application 6712. Issued to Frank Piccardo et al., Stockton, September 18, 1930, for 0.92 c.f.s. from San Joaquin River in Sec. 5, T. 1 S., R. 6 E., M. D. M., for irrigation and domestic purposes on 73.7 acres. Estimated cost \$3,000.

HUMBOLDT COUNTY—Permit 3564, Application 6524. Issued to F. A. Leach and F. D. Smith, Fortuna, September 18, 1930, for 0.54 c.f.s. from Eel River in Sec. 24, T. 1 N., R. 1 E., S. B. M., for irrigation on 42.6 acres. Estimated cost \$200.

EL DORADO COUNTY—Permit 3565, Application 6685. Issued to J. S. Goldie, Sacramento, September 19, 1930, for 400 g.p.d. from unnamed creek in Sec. 19, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

RIVERSIDE COUNTY—Permit 3566, Application 6661. Issued to J. O. Blackburn, Hemet, September 19, 1930, for 0.005 c.f.s. from Bee Canyon Springs in Sec. 12, T. 5 S., R. 1 E., S. B. M., for irrigation and domestic on 5 acres. Estimated cost \$3,000.

EL DORADO COUNTY—Permit 3567, Application 6679. Issued to Sierra Camps, Inc., Berkeley, September 22, 1930, for 0.1 c.f.s. from Ralston Creek in Sec. 34, T. 12 N., R. 17 E., M. D. M., for recreation and domestic purposes. Estimated cost \$200.

FRESNO COUNTY—Permit 3568, Application 6684. Issued to Sherley De Vine, Dunlap, September 23, 1930, for 0.01 c.f.s. from unnamed spring in Sec. 4, T. 14 S., A. 27 E., M. D. M., for irrigation, domestic and stockwatering on 1 acre. Estimated cost \$250.

SAN BERNARDINO COUNTY—Permit 3569, Application 6592. Issued to John M. Willoughby, Los Angeles, September 23, 1930, for 0.5 c.f.s. from West Fork Dry Creek in Sec. 15, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic on 40 acres. Estimated cost \$600.

MODOC COUNTY—Permit 3570, Application 6681. Issued to C. C. Jones, Cedarville, September 24, 1930, for 3 c.f.s. from Steamboat Creek in Sec. 10, T. 41 N., R. 16 E., M. D. M., for irrigation on 130 acres.

SAN BERNARDINO COUNTY—Permit 3571, Application 6663. Issued to Otto E. Kanka, Lucerne Valley, September 24, 1930, for 0.5 c.f.s. from 2 unnamed springs in Sec. 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic on 80 acres. Estimated cost \$3,000.

SAN JOAQUIN COUNTY—Permit 3572, Application 5248. Issued to Banta Carbona Irrigation Dist., Tracy, September 25, 1930, for 40 c.f.s. from San Joaquin River in Sec. 34, T. 2 S., R. 6 E., M. D. M., for irrigation and domestic on 18,321.19 acres. Estimated cost \$334,000.

EL DORADO COUNTY—Permit 3573, Application 6626. Issued to El Dorado National Forest, Placerville, September 25, 1930, for 0.0019 c.f.s. from Hemlock Creek in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$250.

EL DORADO COUNTY—Permit 3574, Application 6627. Issued to El Dorado National Forest, Placerville, September 25, 1930, for 0.0019 c.f.s. from Hemlock Creek in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$200.

BUTTE COUNTY—Permit 3575, Application 6697. Issued to H. N. Dally, Magalia, September 26, 1930, for 2 c.f.s. from Middle Butte Creek in Sec. 34, T. 23 N., R. 3 E., M. D. M., for mining and domestic purposes. Estimated cost \$500.

SAN BERNARDINO COUNTY—Permit 3576, Application 6687. Issued to Stanley Visel, Los Angeles, September 27, 1930, for 446 g.p.d. from unnamed spring in Sec. 9, T. 2 N., R. 3 W., S. B. M., for domestic purposes. Estimated cost \$300.

SISKIYOU COUNTY—Permit 3577, Application 6619. Issued to John A. Foss, Hamburg, September 27, 1930, for 0.25 c.f.s. from Caroline Creek in Sec. 13, T. 46 N., R. 12 W., M. D. M., for irrigation of 20 acres. Estimated cost \$500.

SANTA CLARA COUNTY—Permit 3578, Application 6601. Issued to G. T. Letcher, San Jose, September 29, 1930, for 0.08 c.f.s. from unnamed spring in Sec. 10, T. 7 S., R. 3 W., M. D. M., for irrigation and domestic purposes.

Applications for permit to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of September, 1930.

LOS ANGELES COUNTY—Application 6785. B. F. Porter Estate (a corporation), 58 Sutter St., San Francisco, for 0.50 c.f.s. from Mormon Canyon Creek tributary to Browns Canyon thence San Fernando Valley to be diverted in Sec. 32, T. 3 N., R. 16 W., S. B. E., and M., for domestic and irrigation of 40 acres. Estimated cost \$2,000.

SHASTA COUNTY—Application 6786. August L. Cox and W. E. Winston, c/o J. P. Kelly, 605 10th St., Sacramento, for 0.93 c.f.s. from Nelson Creek tributary to Pit River to be diverted in Sec. 29, T. 37 N., R. 1 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$1,200.

HUMBOLDT COUNTY—Application 6787. C. M. Salyer, Salyer, Trinity County, for 50 c.f.s. from Madden (sometimes called Campbell) Creek tributary to South Fork of Trinity River to be diverted in Sec. 20, T. 6 N., R. 5 E., H. M., for mining purposes. Estimated cost \$91,000.

TRINITY COUNTY—Application 6788. Mrs. Chas. H. Miller, Chico, for 600 g.p.d. from unnamed spring tributary to S. Fk. Trinity River to be diverted in Sec. 19, T. 1 S., R. 8 E., H. M., for domestic purposes. Estimated cost \$600.

CALAVERAS COUNTY—Application 6789. Lloyd B. Frenshel, 929 N. Eldorado St., Stockton, for 500 g.p.d. from Big Meadow Creek tributary to N. Fk. Stanislaus River to be diverted in Sec. 32, T. 7 N., R. 17 E., M. D. M., for domestic use.

BUTTE COUNTY—Application 6790. Edward Steadman, Oroville, for 3 c.f.s. from Feather River tributary to Sacramento River to be diverted in Sec. 27, T. 18 N., R. 3 E., M. D. M., for domestic and irrigation on 253.117 acres. Estimated cost \$8,000.

SIERRA COUNTY—Application 6791. William F. Bickel, Palace Hotel, San Francisco, for 25 c.f.s. from Goodyear Creek tributary to N. Fk. Yuba River to be diverted in Sec. 9, T. 20 N., R. 10 E., M. D. M., for mining purposes.

INYO COUNTY—Application 6792. A. Z. Borden & James Brown, Skeleton Mining Co., c/o James Brown, 7712 Hampton Ave., Hollywood, for 0.65 c.f.s. from 4 springs tributary to Emigrant Canyon thence Death Valley to be diverted in Secs. 31 and 32, T. 7 N., R. 44 E., M. D. M., for mining, milling and domestic use. Estimated cost \$1,000.

KERN COUNTY—Application 6793. J. R. Blanco, Maricopa, for 720 g.p.d. from unnamed spring tributary to Stork Creek, thence Kern River to be diverted in Sec. 36, T. 28 S., R. 30 E., M. D. M., for stock-water purposes.

MONTREY COUNTY—Application 6794. Stuart Haldorn, c/o Agnew & Boekel, Attys., Federal Reserve Bank Bldg., San Francisco, for 2 c.f.s. from Higuera Creek tributary to Sur River to be diverted in Sec. 24, T. 19 S., R. 1 E., M. D. M., for power purposes. 20 theoretical horsepower to be developed.

MONTREY COUNTY—Application 6795. Stuart Haldorn, c/o Agnew & Boekel, Attys., Federal Reserve Bank Bldg., San Francisco, for 0.2 c.f.s. from Higuera Creek tributary to Sur River to be diverted in Sec. 24, T. 19 S., R. 1 E., M. D. M., for irrigation and domestic on 10 acres.

HUMBOLDT COUNTY—Application 6796. State of California, Department of Public Works, Division of Highways, Sacramento, for 0.0015 c.f.s. from unnamed spring tributary to S. Fk. of Eel River to be diverted in Sec. 28, T. 2 S., R. 3 E., H. M., for recreational purposes. Estimated cost \$250.

EL DORADO COUNTY—Application 6797. Gertrude E. White, Woodland, for 200 g.p.d. from Forni Creek tributary to S. Fk. American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$50.

SIERRA COUNTY—Application 6798. Kate Hardy Mining Co., c/o R. F. Taylor, Downieville, for a total of 0.2 c.f.s., 0.1 from each of 2 unnamed ravines tributary to Woodruff Creek, thence N. Fk. Yuba River to be diverted in Sec. 19, T. 19 N., R. 10 E., M. D. M., for mining and domestic purposes. Estimated cost \$650.

TUOLUMNE COUNTY—Application 6799. Oakland Piedmont Council, Boy Scouts of America, 221 Thayer Bldg., Oakland, for 0.1 c.f.s. from Middle Fk. Tuolumne River tributary to Tuolumne River to be diverted in Sec. 15, T. 1 S., R. 13 E., M. D. M., for recreational and domestic purposes. Estimated cost \$1,560.

PLUMAS COUNTY—Application 6800. S. E. Colburn & A. E. Banks, c/o S. E. Colburn, Crescent Mills,

for 1.0 c.f.s. from unnamed stream tributary to Indian Creek, thence N. Fk. Feather River to be diverted in Sec. 35, T. 26 N., R. 9 E., M. D. M., for power and domestic purposes. Estimated cost \$2,000.

EL DORADO COUNTY—Application 6801. Frank La Montagne, Walter Kurtz & Carl Larsen, c/o Frank La Montagne, Antioch, for 600 g.p.d. from unnamed spring tributary to S. Fk. American River to be diverted in Sec. 29, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$30.

SAN JOAQUIN COUNTY—Application 6802. Western Pacific Railroad Co., c/o J. W. Williams, City Engr., 220 Montgomery St., San Francisco, for 0.885 c.f.s. from Potato Slough tributary to S. Fk. Mokelumne River to be diverted in Sec. 13, T. 3 N., R. 3 E., M. D. M., for industrial purposes. Estimated cost \$11,500.

EL DORADO COUNTY—Application 6803. May A. Sanborn, 547 Ralston St., Reno, Nevada, for 0.025 c.f.s. from Cox Creek tributary to S. Fk. American River to be diverted in Sec. 21, T. 11 N., R. 14 E., M. D. M., for domestic and fire protection.

MONTREY COUNTY—Application 6804. Fort Klamath Meadows Co., c/o C. N. Hawkins, Hollister, for 100 c.f.s. and 15 ac. ft. from Peach Tree Creek tributary to San Lorenzo Creek to be diverted in Sec. 12 (direct div.) T. 20 S., R. 10 E., M. D. M., (storage) Sec. 20, T. 20 S., R. 11 E., M. D. M., for irrigation. Estimated cost \$3,000.

MENDOCINO COUNTY—Application 6805. L. A. Howie, c/o A. L. Wenek, Atty., Ukiah, for 0.14 c.f.s. from Russian River (Redwood Valley Br.) tributary to Russian River to be diverted in Sec. 32, T. 17 N., R. 12 W., M. D. M., for irrigation and domestic purposes. Estimated cost \$1,000.

TRINITY COUNTY—Application 6806. John H. Dequay, 47 W. 44th St., New York City, for 4 c.f.s. from Scorpion Creek tributary to Trinity River to be diverted in Sec. 4, T. 37 N., R. 7 W., M. D. M., for power purposes. (45.45 h.p.)

MERCED COUNTY—Application 6807. El Nido Irrigation Dist., Bank of America Bldg., Stockton, 80 c.f.s. from (1) Deadman and (2) Dutchman Creek tributary to (1) San Joaquin River, (2) Deadman Creek to be diverted in Sec. (1) 26 and (2) 35, T. 8 S., R. 14 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$135,000.

MONO COUNTY—Application 6808. Wm. Symons, Box 118, Laws, for 3 c.f.s. from an abandoned well tributary to Adobe Creek to be diverted in Sec. 29, T. 1 N., R. 30 E., M. D. M., for irrigation purposes.

SONOMA COUNTY—Application 6809. Albert P. Kozler, 1307 Webster St., San Francisco, for 0.037 c.f.s. from Porter Creek tributary to Mark West Creek and Russian River to be diverted in Sec. 14, T. 8 N., R. 7 W., M. D. M., for irrigation and domestic purposes. (23 acres). Estimated cost \$750.

DAM APPLICATIONS

AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of September, 1930.

MODOC COUNTY—Rye Grass Swale Dam No. 150. First National Bank of Alturas, Alturas, owner; earth fill, 8.8 feet above streambed with a storage capacity of 160 acre-feet, situated on Rye Grass Swale tributary to Canyon Creek, in Sec. 25, T. 41 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—Shady Creek Dam No. 312. Empire Mines, Inc., San Francisco, owner; gravity, 12.3 feet above streambed, situated on Shady Creek tributary to South Yuba River in Sec. 15, T. 17 N., R. 8 E., M. D. M., for diversion purposes for irrigation use.

NEVADA COUNTY—Pine Grove Dam No. 312-2. Empire Mines, Inc., San Francisco, owner; earth fill, 29 feet above streambed with a storage capacity of 250 acre-feet, situated on an unnamed creek tributary to South Yuba River in Sec. 19, T. 17 N., R. 8 E., M. D. M., for storage purposes for mining use.

INYO COUNTY—Horton Lake Dam No. 74. Round Valley Irrigation District, Bishop, owner; rock fill, 12 feet above streambed with a storage capacity of 20

acre-feet, situated on Horton Creek, tributary to Owens River, located in Sec. 23, T. 7 S., R. 30 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1,500.

SACRAMENTO COUNTY—Willow Hill Dam No. 453-2. Natomas Water Company, Sacramento, owner; earth fill, 16 feet above streambed with a storage capacity of 125 acre-feet, located in Sec. 12, T. 9 N., R. 8 E., M. D. M., for storage purposes for irrigation and mining use.

PLUMAS COUNTY—Grizzly Creek Dam No. 285. Clover Valley Lumber Company, Loyalton, owner; buttress, 30 feet above streambed with a storage capacity of 174 acre-feet, situated on Grizzly Creek, tributary to Middle Fork of Feather River in Sec. 20, T. 23 N., R. 14 E., M. D. M., for storage and diversion purposes for various uses.

SIERRA COUNTY—Lower Sardine Dam No. 294-4. E. A. & J. O. Hayes, San Jose, owner; wood, 6 feet above streambed with a storage capacity of 62 acre-feet, situated on North Fork of Yuba River, tributary to Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. M., for diversion purposes for power use.

SIERRA COUNTY—Summit Lake Dam No. 294-5. E. A. & J. O. Hayes, San Jose, owner; rock and earth fill, 6 feet above streambed with a storage capacity of 106 acre-feet, situated on North Fork of Yuba River tributary to Yuba River in Sec. 21, T. 21 N., R. 12 E., M. D. M., for storage purposes for power use.

RIVERSIDE COUNTY—Reynolds Slough Dam No. 523. Santa Ana River Development Company of Anaheim, owner; earth fill, situated on Mill Creek tributary to Santa Ana River, for storage purposes for recreation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of September, 1930.

STANISLAUS COUNTY—La Grange Dam No. 68-2. Turlock & Modesto Irrigation District, Turlock and Modesto, owner; gravity arch, 131 feet above streambed with a storage capacity of 3000 acre-feet, situated on Tuolumne River tributary to San Joaquin River in Sec. 16, T. 2 S., R. 14 E., M. D. M., for storage purposes for irrigation use. Estimated cost of enlargement \$7,500. Fees paid \$75.

MODOC COUNTY—Porter Dam No. 162. Pearl F. Porter, Alturas, owner; earth and rock fill, 22 feet above streambed with a storage capacity of 250 acre-feet, situated on a ditch tributary to Parker Creek in Sec. 12, T. 42 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost of enlargement \$750. Fees paid \$20.

LOS ANGELES COUNTY—Whittier Reservoir No. 4. Dam No. 13-2. City of Whittier, Whittier, owner; earth fill, 54½ feet above streambed with a storage capacity of 32.3 acre-feet, situated on a canyon tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. M., for storage purposes for municipal use. Estimated cost \$65,000. Fees paid \$650.

SAN BENITO COUNTY—Hawkins Dam No. 651. C. N. Hawkins, Hollister, owner; earth fill, 67 feet above streambed with a storage capacity of 1000 acre-feet, situated on Los Yubas Creek tributary to Pajaro River, located on Rancho Ausaymas, San Felipe, for storage purposes for irrigation use. Estimated cost of enlargement \$2,000. Fees paid \$30.

LOS ANGELES COUNTY—Pine Canyon Dam No. 19. City of Pasadena, Pasadena, owner; gravity, 265 feet above streambed with a storage capacity of 63,660 acre-feet situated on San Gabriel River, tributary to Pacific Ocean in Sec. 13, T. 1 N., R. 10 W., S. B. M., for storage purposes for municipal use. Estimated cost \$6,500,000. Fees paid \$10,250.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of September, 1930.

MODOC COUNTY—Cummings No. 2 Dam No. 148-2. John O. Cummings, Alturas, owner; earth, situated on Rock Creek, tributary to Pit River in Sec. 25, T. 43 N., R. 11 E., M. D. M. Nature of repairs, pave spillways.

MODOC COUNTY—Cantrall Dam No. 140. Charlotte Cantrall, Alturas, owner; earth fill, situated on a ditch tributary to Pine Creek in Sec. 33, T. 42 N., R. 13 E., M. D. M.

MODOC COUNTY—James Porter Dam No. 142. James C. & Phear E. Porter, Alturas, owners; earth fill, situated on an unnamed drainage, tributary to Parker Creek in Sec. 1, T. 42 N., R. 13 E., M. D. M.

MODOC COUNTY—Crowder Dam No. 128. Lake Short Cattle Company, Davis Creek, owner; earth fill, situated on Franklyn Creek tributary to North Fork of Pit River, in Sec. 7, T. 44 N., R. 14 E., M. D. M.

MODOC COUNTY—Kelley Dam No. 152. Kelley & Meckfessel, Davis Creek, owners; earth fill, situated on tributary of Canyon Creek tributary to Pit River in Sec. 6, T. 41 N., R. 11 E., M. D. M.

MODOC COUNTY—Dannhauser Dam No. 161. Weber & Moffitt, Alturas, owner; earth fill, situated on a ditch tributary to Pit River in Sec. 8, T. 41 N., R. 13 E., M. D. M.

MODOC COUNTY—Upper Pasture Dam No. 161-2. Weber & Moffitt, Alturas, owner; earth fill, situated on Yankee Jim Slough tributary to Pit River in Sec. 3, T. 41 N., R. 13 E., M. D. M.

MODOC COUNTY—Nelson Spring Dam No. 137. J. D. Flournoy, Likely, owner; earth fill, situated on Nelson Spring tributary to Pit River in Sec. 33, T. 40 N., R. 12 E., M. D. M.

ALPINE COUNTY—Lower Blue Lake Dam No. 97-62. Pacific Gas & Electric Co., San Francisco, owner; earth fill, 43 feet above streambed with a storage capacity of 4130 acre-feet, situated on Blue Creek for storage purposes for power use.

LASSEN COUNTY—Fleming Dam No. 241. Richard Casseleas, Wendell, Lassen County, owner; earth, situated on unnamed drainage tributary to Ash Creek in Sec. 6 T., 37 N., R. 11 E. M. D. B. and M.

ALPINE COUNTY—Twin Lakes (American) No. 97-59. Pacific Gas & Electric Company, San Francisco, owner; arch dam, situated on branch of Silver Fork tributary to So. Fork American River in Sec. 22, T. 10 N., R. 17 E., M. D. B. and M.

SHASTA COUNTY—North Battle Creek Dam No. 97-96. Pacific Gas & Electric Company, San Francisco, owner; rock fill, situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. B. and M.

MODOC COUNTY—Williams Dam No. 149. Sheldon Potter, San Francisco, owner; rock dam in Sec. 29, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Duncan Dam No. 149-2. Sheldon Potter, San Francisco, owner; earth dam located in Sec. 33, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Jacks Swamp Dam No. 149-3. Sheldon Potter, San Francisco, owner; rock dam, situated in Sec. 28, T. 43 N., R. 10, M. D. B. and M.

LASSEN COUNTY—Caribou Lake Dam No. 234. J. A. Bennett, Chico, owner; tributary to Susan River in Sec. 34, T. 31 N., R. 7 E., M. D. B. and M.

MODOC COUNTY—Kelley & Greiner Dam No. 133. L. McHugh & Geo. L. Dewey, Alturas, owners; earth and rock dam.

PLANS APPROVED

Plans and specifications for the completion, enlargement or construction of dams approved by the State Department of Public Works, Division of Water Resources during the month of September, 1930.

SOLANO COUNTY—Swanzey Dam No. 443. California and Hawaiian Sugar Refining Corp., San Francisco, owner; earth dam, 55 feet above streambed with a storage capacity of 107 acre-feet, located in Sec. 30, T. 3 N., R. 3 W., M. D. B. and M. For balancing purposes, for industrial use.

Plans for the repair or alteration of dams approved by the Department of Public Works, Division of Water Resources during the month of September, 1930.

PLACER COUNTY—Kelley Lake Dam No. 97-24. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on Six Mile Valley tributary to North Fork American River in Sec. 25, T. 17 N., R. 12 E., M. D. B. and M.

ALPINE COUNTY—Twin Lakes (Electra) Dam No. 97-69. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on a small creek tributary to North Fork Mokelumne River in Sec. 25, T. 9 N., R. 18 E., M. D. B. and M.

ALPINE COUNTY—Upper Blue Lake Dam No. 97-70. Pacific Gas & Electric Company, San Francisco,

owner; earth dam situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 18, T. 9 N., R. 19 E., M. D. B. and M.

ALPINE COUNTY—Lower Blue Lake Dam No. 97-62. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 30, T. 9 N., R. 19 E., M. D. B. and M.

MODOC COUNTY—Crowder Dam No. 128. Lake Shore Cattle Company, Davis Creek, owner; earth dam situated on Franklyn Creek tributary to North Fork Pit River in Sec. 7, T. 44 N., R. 14 E., M. D. B. and M.

MODOC COUNTY—Kelley Dam No. 152. John Kelley and Gus Mockfessel, Davis Creek, owner; earth dam situated on creek tributary to Canyon.

MODOC COUNTY—Upper Pasture Dam No. 161-2. Weber and Moffitt, Alturas, owner; earth dam situated on Yankee Jim Slough tributary to Pit River in Sec. 3, T. 41 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Cummings Reservoir No. 2, No. 148-2. J. W. Cummings Estate, Alturas, owner; earth dam situated on Rock Creek tributary to Pit River in Sec. 25, T. 43 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Nelson Spring Dam No. 127. J. D. Plournoy, Likely, owner; earth dam situated on Nelson Spring tributary to Pit River in Sec. 33, T. 40 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Dannhauser Dam No. 161. Weber & Moffitt, Alturas, owner; earth dam situated on ditch from Yankee Jim Slough tributary to Pit River in Sec. 8, T. 41 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Williams Dam No. 149. Sheldon Potter, San Francisco, owner; rock dam located in Sec. 29, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Duncan Dam No. 149-2. Sheldon Potter, San Francisco, owner; earth dam located in Sec. 33, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Jack's Swamp Dam No. 149-3. Sheldon Potter, San Francisco, owner; rock dam located in Sec. 28, T. 43 N., R. 10 E., M. D. B. and M.

LASSEN COUNTY—Caribou Lake Dam No. 234. J. A. Bennett, Chico, owner; earth dam situated on drainage tributary to Susan River in Sec. 34, T. 31 N., R. 7 E., M. D. B. and M.

LASSEN COUNTY—Fleming Dam No. 241. Richard Castaneda, Wendell, owner; earth dam situated on unnamed drainage tributary to Ash Creek in Sec. 6, T. 37 N., R. 11 E., M. D. B. and M.

AUTOING 25 YEARS AGO

How would you like to have an automobile that could make a trip from Los Angeles to Santa Barbara in a single day? This question may sound funny today, but it was asked in all seriousness 25 years ago in motordom when an endurance run was planned by the Automobile Club of Southern California and Los Angeles motoring enthusiasts.

The start was made from Los Angeles at 8 o'clock in the morning and it was expected the speedsters would arrive in Santa Barbara at 6 o'clock the same evening. This distance was 110 miles and only experienced motorists having high class cars attempted the stunt.

PANAMA CANAL ZONE—Engineers of the Panama Canal Zone have completed a survey for a highway across the Isthmus of Panama. The length of the road is 46 miles; the highest altitude reached 482 feet above sea level; number of bridges required, 46; number of culverts per mile, 10; estimated cost, \$6,000,000.

"Gosh," exclaimed the young doctor, looking at that car he was thinking, thinking, thinking, of buying, "the mere sight of it sets up violent cardiac disturbances, superinduces dryness of the palate, epiglottitis and larynx, brings on symptoms of vertigo and raises the diastolic blood pressure 20 centimeters."—*The Garageman.*

Traffic Safety Campaign Program for 1931 Told

Concentrating each month on a specific type of traffic law violation, a program for a continuous statewide effort during 1931 by the California Committee on Public Safety has been announced by Senator Arthur H. Breed, chairman of the committee. The committee is composed of representatives of forty organizations and state departments concerned with the traffic problem.

The success of the month to month campaigns which were begun last year, with each period devoted to a different phase of safe driving, has prompted the committee to formulate a program for another twelve months of activity along similar constructive lines. The program follows:

January—Failure to yield right of way at intersections.

February—Unlawfully passing standing street cars.

March—Failure to give required arm signals; failure to keep in the proper lane when turning; cutting in and other law violations when overtaking another motorist.

April—Excessive speed at intersections where view is obstructed.

May—Disobeying boulevard stop regulations.

June—Endangering safety of children at play; speed or inattention.

July—Railway stop signals (wig-wags).

August—Failure to keep to the right; "hogging the road."

September—Unlawful speed in school zones.

October—Inadequate brakes.

November—Illegal and glaring headlights.

December—Disobeying regulations for pedestrian protection.

While traffic authorities will intensify attention to certain enforcement provisions each month, there will be no let up in the general and systematic enforcement of all the laws.

SPEED LAWS ARE NOT SO NEW

At Boston, and in 1757—one hundred and seventy-three years ago—the board of "selectmen" passed an ordinance which read:

"Owing to the great danger arising oftentimes from coaches, sleighs, chairs and other carriages on the Lord's days, as people are going to or coming from the several churches in this town, being driven with great rapidity, and the public worship being oftentimes much disturbed by such carriages, it is therefore voted and ordered that no coach, sleigh, chair, chaise or other carriage at such times be driven at a greater rate than a foot-pace, on penalty to the master of the slave or servant so driving of the sum of 10 shillings."

STOP SIGN

Bridegroom—Step up, Bill, it's time to kiss the bride.

Bill—You're wrong, it's time to quit.—Exchange.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

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B. B. MEEK-----Director

CORNING DE SAULES-----Deputy Director

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M. B. HARRIS, Commissioner, Patterson Bldg., Fresno

JOSEPH M. SCHENCK, Commissioner, c/o United Artists Studio, Santa Monica Blvd., Los Angeles

FRED S. MOODY, Commissioner, 640 Kohl Bldg., San Francisco

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T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

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L. H. GIBSON, District V, San Luis Obispo

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R. E. PIERCE, District X, Sacramento

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EUGENE W. BISCAILUZ, Superintendent of
California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor

Port of San Jose—Not appointed

Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



Official Journal of the Department of Public Works
State of California

NOVEMBER


1930

The new Feather River Highway Gateway Bridge which will be dedicated this month at Oroville



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State Moves to Aid Unemployed

MOVING swiftly to assure maximum aid from the state to relieve unemployment conditions in California, B. B. Meek, director of the Department of Public Works, announced to the Governor's Council on October 28th that plans had been perfected by the California Highway Commission and Division of Highways whereby from 2000 to 3200 additional men will be given work during the winter months with maintenance crews and at labor camps to be established on the state highway system.

The California Highway Commission at its meeting on November 6th formally ratified the plans of the Division of Highways for the unemployment relief work, and set up a fund of \$1,000,000 to finance the work.

Following immediately upon Mr. Meek's announcement, the machinery of the Division of Highways was put into motion arranging for the enlargement of maintenance crews and selecting sites for the new camps and building housing accommodations for the men to be employed there.

BASIS OF CAMP SITE SELECTION

The sites for the new camps were determined by the following conditions:

First, adaptability for profitable use of a maximum of hand work and a minimum of machinery;

Second, adaptability for operation during the winter months;

Third, advantages that the locations offer for an even distribution of employment between the northern and southern sections of the state.

MAINTENANCE CREWS

Crews engaged in maintenance work in various parts of the state will be enlarged and approximately 1200 men employed in this manner in addition to those now engaged in maintenance operations.

The enlargement of the maintenance crews will enable relief to be afforded over a large section of California without necessity of providing housing accommodations for the men thus employed.

Commenting upon his first announcement, Director Meek further stated that the new employment will be confined strictly to bona fide residents of California, and that labor



B. B. MECK

will be employed through the free employment agencies operated by the State Department of Industrial Relations.

A wage of \$3 per day with board and lodging will be paid to the men in camps and \$4 a day to the men in maintenance crews who provide their own upkeep.

In working out the details of the plans for the new labor camps, the Division of Highways is having the full cooperation of Director Will J. French of the Department of Industrial Relations and his corps of assistants.

The Division of Highways will operate the camps in which the men will be housed and fed.

CAMP SITES

The camp sites thus far selected are as follows:

Feather River Lateral—Camp site at Rich in Plumas County; A. N. Lund, superintendent.

Carmel-San Simeon Highway—Camp site at Anderson Canyon in Monterey County south of the Big Sur; W. B. Albertson, superintendent.

Valley Route, Sacramento to Los Angeles—Camp site on Ridge Route alternate in Los

Angeles County; R. L. Thomas, superintendent.

Arroyo Seco Highway—Camp site at Arroyo Seco in Los Angeles County; A. N. George, superintendent.

Each camp will accommodate 250 men.

FOLLOWS POLICY

The operation of these camps is in accordance with the established policy of the administration to expand public works to the maximum during the present period of depression and unemployment. This policy during the past three years has been reflected in the largest state highway building program in the history of California. The new labor camps now being established are a further expression of this policy, and are intended to reduce distress from unemployment during the winter months as far as it lies within the ability of the state so to do.

The added work is being financed from savings made on contracts and money accumulated through the progressive reduction of overhead costs on state highway construction.

Commenting on the employment of these men as a means of assisting the labor situation in the state, Mr. Meek had the following to say:

"It is indeed gratifying to the Department of Public Works that it finds itself in a position to render substantial aid to the unemployed of California during the coming winter months. The fact that the work to be provided for this purpose is financed from the savings on contracts and from the reduction in overhead costs evidences the thrifty manner with which the Division of Highways has conducted its affairs.

"There is one further phase of this matter that will be of particular interest.

"Without the budget system governing state highway expenditures which was put in force for the first time during the first year of Governor Young's administration, it would be impossible to employ the 2000 additional men that it is now proposed to put at work on the state highway system. One of the by-products of the budget system, as it applies to state highways, has been the creation of a reserve of construction projects, capable of being drawn upon to provide employment in times of depression. The reason for this is that the budget is for all practical purposes a program for highway construction prepared in advance for a two-year period. The preparation of such a program requires that the basic engineering on projects, proposed for inclusion in the program, be completed in advance of the presentation and adoption of the budget. It obviates the long delays for engineering investigation that frequently makes public works unavailable for relief to labor and business in times of stress. By reason of the fact that this basic engineering has been completed in advance on a large number of highway projects, California has been able to expand its highway building program in the past two years and is now able to further expand it, and to offer work to the public at a time when this work is most needed."

Value of Tourist Industry Told by U. S. Commerce Department

We hear much about the "tourist industry" being one of the state's largest industries. But outside of a general notion that "lots" of people visit California every year, and spend a good deal of money here, we seldom get any definite idea of just what the "tourist industry" means to the state in dollars and cents, says San Francisco *Business*.

Dr. Julius Klein, Assistant Secretary of the United States Department of Commerce, has made an exhaustive study of the way in which tourist money is diffused through the community. He arrives at the conclusion that it is distributed in the following percentages:

Six per cent goes for confectionery and sweets; 11½ per cent for garage and accessories; 10 per cent for transportation; 17 per cent for hotels or lodging, while 25 per cent is spent in retail stores. Restaurants receive about 20 per cent, while 8½ cents of the tourist's dollar goes for amusements or theaters.

Californians, Inc., estimated early in the spring of this year that 760,000 tourists would come to northern and central California during 1930. This estimate has now been borne out by the reports of the various transportation and tourist agencies, and the check on visiting pleasure cars at the various points of entry to the state.

Californians, Inc., also finds that the average tourist stays 5½ days, and spends, conservatively, \$7.50 per day. Using these figures and applying them to Dr. Klein's percentages, the organization finds that northern California's 1930 tourist crop is contributing about \$30,400,000 to the community in the following manner:

For hotel rooms or lodging.....	\$5,528,000
For restaurant meals and groceries.....	6,080,000
For clothes, novelties and souvenirs.....	7,600,000
For transportation, train, bus, steamer, plane.....	3,400,000
For tires, tubes, gasoline and oil.....	3,740,000
For movies, resort concessions, etc.....	2,584,000
For soda fountains, refreshments and candy bars.....	1,824,000

From all of which it appears that the tourist industry is indeed a profitable one for business in California. To be sure, no way has yet been determined of ascertaining accurately and exactly just how many tourists come to the state, and just how much they spend here. In the very nature of things, estimates on the subject can only be approximations, but all the evidence indicates that the calculations of Californians, Inc., are well within the bounds of probabilities, and for that matter are more than likely even too conservative.

Mrs. Bindler—"Is there any difference, Thomas, do you know, between a fort and a fortress?"

Mr. Binder—"I should imagine a fortress, my dear, would be more difficult to silence."—*Utica Press*.

Irrigation in California

By A. N. BURCH, Engineer, Irrigation and Irrigation Investigations, Division of Water Resources

IRRIGATION has been practiced in California from the time of the first Spanish settlements in 1769. However, the practice was not looked upon as of special importance until after the admission of California into the Union in 1850. In fact, for fifteen years after that period no striking progress in irrigation was recorded, but from 1865 to 1880 remarkable development was shown, particularly by the settlers in the southerly arid regions of the state. The area irrigated in 1880 is estimated at 300,000 acres, nearly all of which was located south of Madera County. All irrigation water was then supplied by private companies, by small mutual organiza-

difficulties which beset the irrigators. Many solutions of these problems were suggested. Among other things it was proposed that the federal government should purchase all water rights and canals in the state, construct storage and other necessary works and operate them for the sale of water to the landowners; or, if not the federal government, that the state should do all of these things. There were proposals to abolish riparian rights without compensation to riparian owners; and later it was contended that the state should adopt some comprehensive plan for developing all of the waters of the state and so adjust the rights to use such waters that the people as a



An irrigation scene in the Turlock Irrigation District

tions or by individually-owned works. Although diversion works and canals were generally crude and the use of water wasteful, the great benefit of irrigation in the production of crops was apparent. Even at that early day it was realized that the water supply was inadequate for the lands in the regions of the state where it was most needed, and there occurred rivalry and litigation and sometimes armed conflict over the rights to divert water and over the use of the water once it was taken from the streams.

Through all this contention the riparian doctrine, with the idea that water should be allowed to remain in the streams "unpolluted in quality and undiminished in quantity," loomed large among the multitude of other

whole would derive the greatest possible benefit therefrom. However, it took about forty years to get this idea over, and it was not until 1921 that the legislature made funds available for beginning investigations definitely looking toward the working out of such a plan. Meantime, while the status of water rights has not greatly changed, legislation has been enacted which has served to materially facilitate the irrigation movement and has resulted in a very large development of the irrigation resources of the state, until now over half of the cropped land in the state is irrigated and our irrigated land represents 23 per cent of all of the irrigated area in the United States.

While many water conservation measures have been passed, no other legislation has

(Continued on page 18.)

The Feather River Gateway Bridge

THE largest concrete arch bridge span in California will be opened to travel when on November 28th, the Feather River Gateway Bridge will be formally dedicated.

The new bridge, of which the great concrete arch is the dominating feature, is situated on the Feather River lateral, a short distance above Oroville. Its location is one of surpassing beauty. The bridge itself was designed to take full advantage of the commanding scenery of the Feather River at this point. Massive concrete piers with battered sides and recessed buttresses, together with the graceful sweep of the arch, so harmonize the bridge with its setting that the structure gives the impression of having grown there.

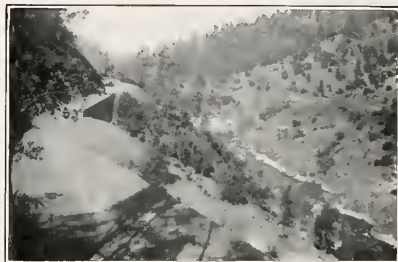
The people of Oroville have planned an impressive ceremony to mark the dedication of the structure in connection with the annual Orange and Olive Exposition held there. Dignitaries of both California and Nevada have been invited to be present upon the occasion.

THE COVER PAGE PICTURE

The picture on the cover page of California Highways and Public Works is that of Miss Florence Johnson, formerly of Oroville and now employed in the Division of Motor Vehicles, Department of Public Works. The picture is that of the Feather River Highway Gateway Bridge, which will be dedicated on November 28th at Oroville.

the importance of which is enhanced by the fact that the ceremony will mark not only the dedication of one of the most important bridges on the state highway system, but will also mark the opening to travel of the first link in the Feather River Highway. This highway when completed will be an all-year route over the Sierras into California, and will open up to travel one of the most interesting and scenic recreational areas of the state.

The bridge itself crosses both the Feather River and the tracks of the Western Pacific Railroad at a point four and one-half miles east of Oroville. The over all length of the bridge is 757 feet 6 inches. The main arch, now the largest concrete arch in California, has a span 270 feet in length, and 145 feet in height above the river. A twelve story building could be placed beneath the struc-



Scene on the Feather River lateral above the new bridge. This portion of the highway was built by convict labor.

ture. On either side of the main bridge are two 84-foot spans. The river gorge proper is of solid rock with a sheer drop of over 50 feet on the south bank. The two largest piers are 108 feet in height.

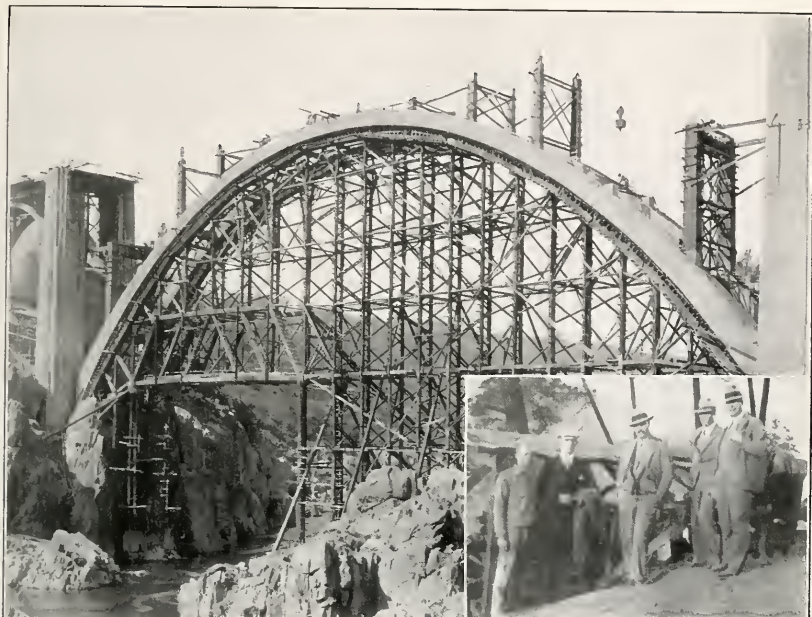
Approximately 6000 cubic yards of concrete and 283 tons of reinforcing steel went into the structure. Excavation of earth and rock amounted to 2400 cubic yards. Material was handled by a high line, set on 80 foot towers, 840 feet apart, carrying a movable carriage with which material could be lifted and placed at any part of the bridge. The structure cost \$170,000. Paul M. White of Santa Monica was the contractor, and I. O. Jahlstrom was the resident engineer for the Division of Highways. The bridge was designed by the Bridge Department of the Division of Highways.

The bridge connects with 4.06 miles of highway connecting the structure with the state highway system at Oroville. On its northern end it connects with 5.6 miles of highway built by a convict highway camp.

VIEWS ON OPPOSITE PAGE

Top picture, the concrete arch in the making. Inset, the men who built the bridge, left to right, Paul M. White, contractor; V. A. Endersby, Construction Engineer, Bridges, Southern Section; F. W. Panhorst, Construction Engineer, Bridges, Northern Section; H. D. Stover, office engineer, Bridge Department, and Chas. E. Andrew, State Bridge Engineer.

Bottom picture, view of bridge showing overpass of Western Pacific Railroad at extreme left. Inset, view of Feather River at bridge site.

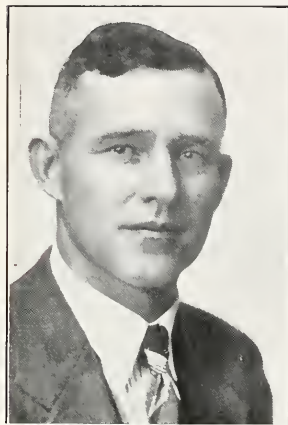


How the State Secures Stability, Durability and Economy in its Buildings

By D. C. WILLETT, Associate Structural Engineer, Division of Architecture

IN THE design of a building, the first and foremost factor is utility, that is, designing the building for the purpose for which it is to be used. Another very important factor is the esthetic. These two are products of the architect. The mechanical

comforts of the building are supplied by the mechanical and electrical engineers. Stability and durability are dependent upon the structural engineer, and upon the economy with which these are obtained, his efficiency is determined. In the past, mathematics played but little part in



D. C. WILLETT

design. What had been found by experience to be safe practice was handed down from one generation to the next. Progress through trial and error from one innovation to the next was necessarily slow; but scientific research has developed more or less accurate data on the properties of material, so that with our mathematical knowledge and skill the design of a structure is now an almost exact science, which takes into account all of the stresses to which the building may subsequently be subjected.

Approximately \$4,000,000 per year has been allotted to provide for the new buildings required by California's some sixty institutions. Between 40 and 50 per cent of this amount is spent in assuring the structural stability of the buildings.

The architect provides the structural engineer with plans and elevations of the proposed

building. In providing for the structural stability of the building, the engineer attacks his problem in the reverse. The builder starts from the foundation, while the engineer begins from the roof and works down, providing for the loads as they accumulate from the roof and from floor to floor.

The first problem is: What are the requirements laid down by the architect? Knowing these, what is the most economical material to use that will give the stability and durability required? Determined upon the materials, the engineer first provides for the actual load of the materials, known as dead load, a constant load that must be carried. To this he adds the varied loads that are intermediately applied, such as wind, snow, and other applied loads, known as live loads. The next and important problem is: What is the deflection or permissible sag allowed in the various structural members?

Knowing the load and the permissible deflection, size of the structural members can be obtained. The limitation of deflection, and not the loads, determines the size of a structural member in many cases. In this way, the size of each structural member of the building is determined until the footings are reached. Knowing the loads from the structure above, and by predetermining the bearing value of the soil on which the building is placed, the size of the footings can be determined. In designing a foundation, it is important that the loads be equally distributed over the entire area so that unequal settlement will not occur to crack the building.

Not only is it important that the most economical material be used, but the most economical layout and use of materials must be had. An engineer may be able to design and properly provide for the superimposed loads that are to be carried, and at the same time be far from an efficient engineer. To this the state is always on its guard. There are many ways in which the structure can be framed, but some are more economical than others. An economical design should also be a balanced design; that is, a design in which the strength of the various units is equal, considering the loads carried. A chain is no stronger than its weakest link. So it is

(Continued on page 13.)



California's School for the Deaf, Berkeley. Kitchen and dining room of the primary unit is shown on the above picture. The building will be a reinforced concrete structure and will be erected in 1931.

Patrol Officers' Duties Cover Range From Saving Purses to Saving Lives

THE WIDE and varied service that the California Highway Patrol is called upon to give motorists of California is reflected in scores of appreciative letters received during the month by the Division of Motor Vehicles.

Excerpts from just a few of these letters follow:

Woman Saved From Drowning.

Captain J. E. Blake reports a summer occurrence as follows:

About 5:30 p. m., Officer Francis (Tony) Beard was hailed on the Donner Lake highway about three miles from Truckee by a man named Brown.

Officer Beard stopped his car and found that there was a woman drowning in Donner Lake. He immediately jumped from the car, dived into the lake and swam about 40 yards to the woman, Mrs. Leida Brown of Reno, who was going down for the second time. He grasped her and swam safely to shore.

This rescue was made by Officer Beard while in uniform, as he did not have time to remove any clothing.

Lost Purse Found.

From Santa Monica comes the following letter:

In July, 1926, I was journeying northward to Berkeley with my infant son and about nine miles north of King City I encountered engine trouble and also discovered I had left my purse at King City. Fortunately for me, Mr. Reinhold came along and not only made three attempts to phone to King City trying to locate my purse, but went two miles out of his way to procure water for the radiator of the car (which lack of water was causing the trouble). At the fourth farmhouse he visited he located a phone and succeeded in locating my purse.

Caution Brings Commendation.

An attorney of Los Angeles writes as follows:

I was stopped on the highway by your Traffic Officer No. 385, yesterday. He cautioned me for what he said was a trivial infraction of traffic law. On this point I disagreed with him, but that is not the purpose of writing this letter.

This officer was unusually courteous and gentlemanly. This so impressed me and the passenger I had in the car that I decided to let your office know that at least one motorist will take the time and trouble to compliment your traffic department and encourage your office and particularly Officer No. 385 in its policy of true law enforcement.

Hit and Run Driver Captured.

This letter is from a Hayward autoist:

I wish to commend the promptness with which Officer George Nardi, No. 242, of Sonoma, captured a hit and run driver who damaged my car on July 6th, endangering the lives of my passengers, the efficient manner in which he acted during the time, held the above driver in custody, and also the manner in which he officiated at the trial of those concerned.

Tire Change Brings Praise.

The following letter from Riverside is self-explanatory:

I was driving with another woman on the lonely road leading to San Juan Capistrano from San Juan Hot Springs. It was about 7 o'clock and very dark. We had a blowout, and while we were waiting there without either equipment or skill to fix it, and miles from a garage, two men came along. We asked them to send back help for us, but instead they stopped and changed the tire. They refused to take any money for the service, and when I asked their names one of them said he was Captain Meehan of Orange County.

Officer Proves Expert in Repairs.

A San Francisco attorney writes in as follows:

On Sunday, July 6, 1930, about 2:15 p. m., between Placerville and Folsom, about eight miles from Folsom, a party of four of us were traveling in an automobile, and by reason of motor trouble, were unable to proceed any further, and were unable to locate our trouble. The officer of the State Highway Patrol in that vicinity on duty, patrolling on a motorcycle, within a few minutes located and cured the motor trouble which had developed. The trouble was of an unique nature and something that would probably happen once in a lifetime.

Unfortunately, in the excitement of getting away, we neglected to obtain the officer's name or badge number, and can only describe him by his location at the particular time above mentioned.

Stolen Car Recovered.

A Long Beach autoist makes the following report:

Your patrolman, Mr. Geo. W. Peterkin, recently did such a wonderful job of recovering my automobile for me and catching the thieves that I want to send you a note telling you that he is a real fellow and understands his business thoroughly. He caught these fellows entirely on suspicion, having no report at all that the car had been stolen, and my car was returned to me immediately.

High School Cooperation.

The following letter is from G. J. Badura, principal of the Fortuna High School, to Mr.

(Continued on page 19.)

Auto License Renewal Period Approaches

BY FRANK G. SNOOK, Chief of the Division of Motor Vehicles

WITHIN a few days the Division of Motor Vehicles will be engaged in its annual task of renewing the licenses of more than two million motor vehicles.

The stage is all set for the task, which promises to be greater than in any previous year. Best available estimates at this time indicate there will have been from 80,000 to 100,000 more cars registered in California in 1930 than in 1929.

In order to provide faster service to the public as well as to "get the jump" on the job we will start receiving applications by mail, as we did last year, on December 1st. These applications will come directly to Sacramento where a large staff of clerks will sort them, type the certificates and put the plates in shape for mailing right after the holidays.

On December 15th we will throw open our counters at Sacramento and at our branch offices, located in Los Angeles, San Diego, Long Beach, Fresno, Oakland and San Francisco, and will receive direct applications for new plates.

Motorists making application in person will receive their license plates at once while certificates will be forwarded to them by mail at a later date.

During the height of the renewal season as many as 2000 persons will be employed. Fortunately for us we do not have to depend entirely on green help as past years have served to train a large number of persons who come in each year and assist us for the short period they are needed.

The task of handling so many license renewals in so short a time is one of great magnitude and must, of necessity, be attended with some confusion because the human element is involved.

It is our hope, however, to get through with a minimum of mistakes and if delay occurs in an occasional case we ask the indulgence of the public.

Under our law all licenses expire at midnight December 31st. Motorists are required to apply for a new license within fifteen days after that time.

January 15th will, therefore, be the "deadline" in making applications although those who can show they have made application are permitted by law to operate fifteen days more.

In addition to the service we ourselves will give, some 120 branch offices of the automobile clubs will assist us by distributing plates to their members. This work on the part of the clubs saves the state many thousands of dollars in overhead expense annually.

During this renewal period we probably will collect in excess of \$6,000,000, the major part of which will go back to the motorists in the form of better roads. California motorists certainly have little to complain of as our fees for registration are cheaper than any other state and the moneys collected all go for building and patrolling the roads and in paying the expenses of the division.

Fees for both pleasure and commercial vehicles are exactly the same as last year.

It is important to remember that all vehicles under 3000 pounds unladen pay a straight fee of \$3 whether used for pleasure or commercial purposes, this change having been effected by legislation which became effective last year.

Owners who have for any reason decreased or increased the weight of their vehicles are required to state the change in making application for license renewal.

We are encouraging the motorists to forward their applications by mail to Sacramento instead of appearing in person. We find it is not only easier and cheaper for us to handle such applications because of their volume but that it is a great accommodation to the motorist inasmuch as it saves him the time and annoyance of a special trip to a branch office where he may be required to stand in line for some time before he can receive service.

The importance of getting the applicant's present proper address is stressed constantly. The only application we require is the white certificate of registration mailed along with the fee. If the applicant has changed his address during the year and does not make the change on his certificate when he sends it in, his plates will go to the wrong address and he will be subjected to delay.

This point can not be stressed too much for every year thousands of motorists fail to observe this instruction.

Another point we have trouble over is getting the motorist who has paid off the contract on his car during the year to have the legal owner sign over the pink certificate to him.

In such cases we require a fee of \$1 for the transfer, in addition to the regular fee.

A few figures on our registrations may be interesting at this point. At this writing the only totals available are those of October 1st. These show a total of fee-paid registrations for the year to that date of 2,048,131 divided as follows: Automobiles, 1,897,807; solid tire trucks, 15,299; pneumatic tire trucks, 79,774; motorcycles, 8973; solid tire trailers, 9321; pneumatic tire trailers, 36,957.

Fee-paid registrations for 1929 totaled 2,026,868. Thus there was a gain for 1930, up to October 1st, of 21,263. Our estimate of 60,000 more for October, November and December would make the year's gain about 81,000.

This is not as large a gain as in previous years but considering general business conditions we regard it as very good.

THE HIGHWAY

From the trail I was but yesterday,
From jog and wiggle and hollow and hump,
From mud and dust and chuck and bump,
I've smoothed my form to the great Highway.

With a graceful sweep of line and grade,
With cut and fill to a figured plan;
Or leaping the gorge with a magic span
I challenge the best that man has made.

I glide through fields aglow with flowers—
Cheery fields where the warm sun smiles.
I thread the maze of forest aisles
Where Woo I Nymphs dance in elfin bowers.

I climb the peaks where lone crags dim
To purple mists with the Evening Star.
I crawl where the broad Stream gleams afar
From my eerie ledge on the canyon's rim.

I explore wide wastes of desert lands
Where the Rulers of Silence dwell
In grandeur more weird than the Lords of Hell
Could mould with myriad Demon hands.

I follow the shore of the majestic Sea,
Where a restless surge chafes the mighty bowl;
And all things merge with an Oversoul
In the vast dim sweep of Infinity.

I call men away from the toiling throng
And bear them afar on humming wheel,
That rings with a message all men feel
Where the open space breathes a wordless song.

It may be the thundering tread of War,
Or wheels of Pleasure, or wheels of Trade,
But there's no rival yet of things man-made
For a good Highway and a motor car.

—ANON.

DRAINAGE SUMPS

By E. EVERS, District Maintenance Engineer

In the San Joaquin Valley, traversed by the Golden State Highway, or State Route 4, are many sags or pockets with no natural drainage outlets, or regions of very slight gradient where irrigation systems have long been in operation, where a condition obtains by reason of which it would be very expensive and difficult to drain the highway by utilizing natural drainage channels.

In Tulare and also in Madera counties, a large measure of relief has been obtained by



View of sump.

constructing dry wells or drainage sumps. The standard sump is eight feet by four feet in plan, and in depth varies from eight feet to twenty-three feet. The depth to which they are carried depends on the tightness of the soil. It is very desirable to reach a coarse sand or gravel stratum which will be pervious. If satisfactory pervious material is not reached at a reasonable depth, the bottom is loosened with powder.

When a depth is reached which shows satisfactory material or beyond which it seems impracticable to excavate, the hole is filled with boulders or broken concrete of approximately uniform size ranging from first size to about twelve inches maximum dimension. The top may be finished off with crushed rock or gravel. In certain cases it is desirable to convey the water from the ditch to the center of the sump by pipe or other means, to prevent caving in of the sides and consequent sealing.

Of those installed in District VI, it is estimated that 10 per cent are complete failures, 40 per cent give results which are worth while, and the remainder give complete satisfaction.

Roadside Clearing on State Highways Pays Big Dividends in Fire Prevention

By M. B. PRATT, State Forester

THE roadside clearing program of the Division of Highways paid big dividends to the State of California this year. It was instrumental in preventing scores of fires in the state and in saving property owners many thousands of dollars in



M. B. PRATT

potential property damage to forests, grain fields and range.

This has been determined by means of a statewide survey just completed by the Division of Forestry through its rangers in all parts of the state.

Each ranger was requested to relate the benefits of roadside clearing in his particular district, the benefits that could be derived if other areas were cleared up, the number of fires that have started along the highway where roadside clearing has not been done, and the number of fires started where it has been done.

The replies were very enlightening. In 22 out of the 28 counties reporting there had not been a single fire this year along highways that had been cleared. In the remaining five counties there had been only seven fires along highways that had been burned.

COUNTIES WITH CLEAR RECORDS

The counties reporting no fires along cleared highways were: Mendocino, Sonoma, Yuba, Trinity, San Benito, Lassen, Tuolumne, San Diego, Siskiyou, Lake, Riverside, Amador, Madera, Tehama, Fresno, Butte, Napa; Santa Clara, Orange, San Luis Obispo, San Bernardino and Santa Cruz.

The five counties reporting fires along areas that had been burned were: Santa Barbara 2, Shasta 2, Tulare 1, Colusa 1, and Monterey 1.

ON UNCLEARED HIGHWAYS

In the counties reporting, a total of 89 fires swept over land adjoining highways that had not been cleared, as follows: Mendocino 1, Shasta 2, Sonoma 5, Yuba 7, Trinity 3, San Benito 6, Lassen 3, Tuolumne 4, Lake 6, Amador 2, Madera 1, Tehama 14, Colusa 8, Fresno 6, Butte 1, Monterey 1, Santa Clara 5, Orange 8 and San Luis Obispo 4.

This is a record of which not only the Division of Highways but the entire State of California may well be proud. To estimate the fire damage prevented by this method in dollars and cents would be an impossibility. But it is sufficient to say that the property saved was worth many, many times more than the state outlay involved in clearing the highways.

STATE PROTECTED

The writer can remember only a few years ago when California's State Highway Commission refused to do any roadside burning



Logging in the older days.

on the ground; that if a fire should get away from a crew the state didn't want to be held responsible for any damage it might do.

The present system of obtaining the consent of the owner before any burning is done along his property has proved to be a protection both to the state and to the owner.

FIRES CAUSED BY CARELESSNESS

Virtually all roadside fires are caused by cigarettes or matches carelessly tossed out of automobiles by motorists or their passengers. The roadside clearing program has nearly eliminated fires from this cause. It has also made it much safer and more convenient for



A highway slope cleared of inflammable material.

campers to park their cars along the roadside for lunch. In Colusa County ranger Charles D. Wilcher says the clearing of roadsides "is keeping down the star thistle, which is fast becoming a nuisance to crops in this valley."

SAN BERNARDINO FIGURES

Before the roadside clearing in San Bernardino County, there was approximately one fire to every 10 miles of highway in grass land, ranger A. T. Sharp reported. This year there has not been a single fire in that county where the highway was properly cleared, and this includes the Waterman canyon road, where more than 100,000 cars travel annually.

"One of the Motor Transit trucks was completely destroyed by fire," Sharp wrote, "on the Waterman Canyon road. This was within a high brush-covered area and no fire equipment was handy. Due to the clearing along

the highway the fire did not escape. Without the clearing it would have spread into the brush and caused considerable damage to the watershed."

TEHAMA COUNTY REPORT

In Tehama County, ranger R. H. Gossett reported, there have been no fires on either the west side highway south of Red Bluff or on the east side highway to the Butte County line. On other uncleared roads in the county there have been 14 fires to date.

EL DORADO COUNTY

Out of a total of 111 fires in El Dorado County, only one was started along state highways that were cleared, according to ranger W. C. Austin.

KERN HAS GRAPHIC STORY

Another outstanding example of the effectiveness of this clearing work may be found in Kern County, on the Bakersfield-to-Tehachapi lateral. In 1928 there were at least 12 roadside fires on this highway, reported ranger Harold P. Bowhay. In 1929 and 1930 the road was cleared, and thus far this year there has not been one fire reported.

ALONG REDWOOD HIGHWAY

How the giant redwoods along the famous Redwood highway have been protected from destruction was told briefly by ranger A. A. Wilkie of Sonoma County, who said: "Clearing that has been done on the Redwood highway in this county has held the fires down 100 per cent."

Before roadside clearing was done in Mendocino County, at least 25 per cent of the fires started along the highways, from campfires or discarded cigarettes. Since this work has been carried on, Inspector R. E. Roach reports the number has been reduced to almost nothing.

TESTIMONY FROM TAHOE-UKIAH ROUTE

The importance of continuing the highway clearing work on the scenic Tahoe-Ukiah route was stressed by ranger W. F. Sharp.

"This highway runs through a very dense growth of timber of about an average age of 40 years," he said. "This area has been logged off in the last few years and a great deal of the old slash is still on the ground, together with a very thick stand of small cedar understory which is about 6 to 8 feet high.

"I understand that the right of way along this highway is 600 feet wide for most of the way, so if we were able to clear only part of the roadside this winter it would be a still

(Continued on page 13.)

HOW THE STATE SECURES STABILITY, DURABILITY AND ECONOMY IN ITS BUILDINGS

(Continued from page 6.)

with a structure. In other words, it is a waste to design or build one unit stronger than necessary or twice as strong as another carrying corresponding loads.

STRUCTURAL MATERIALS

The many structural materials now used can be classed in four general groups, which are, timber, masonry, steel and concrete.

In the determination of the material that will be used in any building, consideration is given to the relative merits and demerits of the various materials named above, with particular reference to the use to which the building is to be put and any peculiar condition that may characterize the site. It is these conditions that determine the real cost of the material, and the economy of its use.

Without entering into the discussion of the relative strength or weakness of these materials, it might be well to add a word relative to concrete.

CONCRETE

Concrete differs from most of the other structural materials in that it must be manufactured at the job. Reinforced concrete has become a universal material in construction and is proving a very durable one even with the careless methods of construction. From a financial standpoint, speed is of prime importance to construction; but this demand for speed and time saving has resulted in careless working methods, thus reducing the strength of concrete. Physical characteristics of concrete are determined not only by the quality of the several materials which enter into it, but perhaps to a greater degree by the proportions in which the materials are mixed; for the proper proportioning of fine and coarse aggregates may double the strength. It is a matter of common experience that the old method of arbitrary selection in which fixed quantities of fine and coarse aggregates are mixed without regard to the size and grading of the individual materials, is far from satisfactory. Not only is it essential that the aggregates be properly graded and proportioned, but the proper amount of mixing water must be used. Tests have shown that "an increase of 13 per cent in the mixing water caused the same reduction in strength as if 33 per cent of the cement is omitted."

The aggregates, which form about 85 per cent of the structural material of a concrete building, are in cases obtained at or near the institutions. This tends to a greater economy of concrete.

The proper placement of the reinforcing in the concrete is another very important feature in concrete construction. Allowing the reinforcement of the average floor slab to be dropped one-half inch from the figures shown is equivalent to a reduction in the strength of the slab of approximately 30 per cent.

By the proper selection of the structural materials, the economical use of these materials, providing properly for the loads to be carried and by proper and intelligent inspection, eliminating the carelessness in construction, is the state provided with stable, durable and economical buildings.

ROADSIDE CLEARING ON STATE HIGHWAYS PAYS BIG DIVIDENDS IN FIRE PREVENTION

(Continued from page 12.)

greater step in the reduction of the present fire hazard, say about 100 feet on each side of the pavement, and another time by clearing another strip."

Dead trees and snags present another problem in highway clearing that deserves careful attention of everyone concerned, because they constitute not only a traffic hazard, but also an extremely dangerous fire menace.

NEED FOR SNAG REMOVAL

Through the courtesy of T. H. Dennis, maintenance engineer, it has been brought to our attention that there are some 2836 snags, by actual count, in Highway District Two.

It would cost approximately \$20,000 to dispose of the snags in this district, Mr. Comley estimates, and an additional \$30,000 to clean up slash and other debris in connection with this snag disposal along the highway.

The condition in the rest of California in the timbered areas is very similar to that of District Two. Although great strides are being made in cleaning up the highways, I am convinced that this is a phase of the work that should be given early attention.

It is hoped that funds may be made available for the purpose of cleaning up dead trees and snags as a further step in the splendid work that has thus far been completed by the Division of Highways in its roadside clearing program.

Tunneling for Highway Under Town

By RICHARD H. WILSON, Office Engineer, District III

ONE'S FIRST association with the word "tunnel" is a hole through a hill through which a railroad train may pass. However, with the present-day standards of highway improvement, the construction of tunnels has become a necessity to accommodate modern road traffic problems.

The latest highway development of this character is now under construction at Newcastle, in Placer County, where a tunnel, 531 feet long, is being driven under a portion of the town and incidentally under the main east-west line of the Southern Pacific Railroad.

Newcastle is located between Roseville and Auburn on State Route 17 and Government Route 40, which road, aside from its local importance, is a portion of one of the main transcontinental highways.

Newcastle is one of the original small towns established in California's early days when high speed automotive traffic was not even a dream. Situated on a high knoll as it is, its tortuous narrow streets lend themselves to most anything else than the condition expedient for boulevard construction, and the necessary widening and straightening would have practically wiped out the small city.

As the Southern Pacific Railroad must be crossed at this point, and is of such height as to allow the construction of an underpass, all other tentative locations, after careful weighing of such factors as cost, alignment, grade, and public convenience and safety, were abandoned in favor of the more direct route through the hill under the town and the railroad. A few of the salient features of a comparison between the present traveled way and the new location may be readily visualized by scanning the tabulation given below:

Comparison of present highway and highway under construction:

	Highway under construction	Present highway	Difference favoring new route
Length	6182 ft.	7606 ft.	1418 ft.
Total rise	145 ft.	219 ft.	74 ft.
Adverse grade	None	74 ft.	74 ft.
Minimum radius curve	1509 ft.	50 ft.	----
Maximum grade	5.12%	*8.00%	----
Minimum width roadway	46 ft.—	21 ft.	----
	30' in tunnel		
Total central angles in curvatures	71°	670°	599°

*2260 feet of present grade is 7.80% or greater.

In addition to the problems stated, the new location involved many local problems which necessitated a great deal of care and planning. The present water and sewer system of the town must be entirely changed and several houses moved; two county roads and the main ditch of the Pacific Gas and Electric Company had to be relocated so as to pass on the railroad sides of the tunnel portals.

Preliminary borings were taken and the elevation of the grade of the tunnel established so that its entire length is in solid granite. This established the elevation of the grade of the tunnel under the Southern Pacific tracks a depth of approximately 86 feet below the base of rail.

The roadway of the new section is normally 46 feet in width, narrowing to a paved 30 feet through the tunnel and heavy approach cuts with a three-foot sidewalk on either side. The center line clearance of the tunnel is 20 feet 9 inches.

Three types of lining will be used, the sections at the two ends and the section immediately under the railroad tracks being concrete and the balance being redwood timber lined, heavy and light types.

An electric lighting system is also to be installed, which should eliminate all hazards from that angle.

The actual cost of tunnel itself, including boring, lining concrete portals, lighting, and contingencies, is \$121,500, or approximately \$230 per lineal foot.

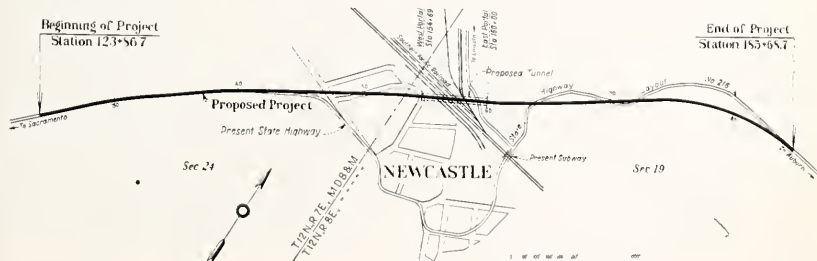
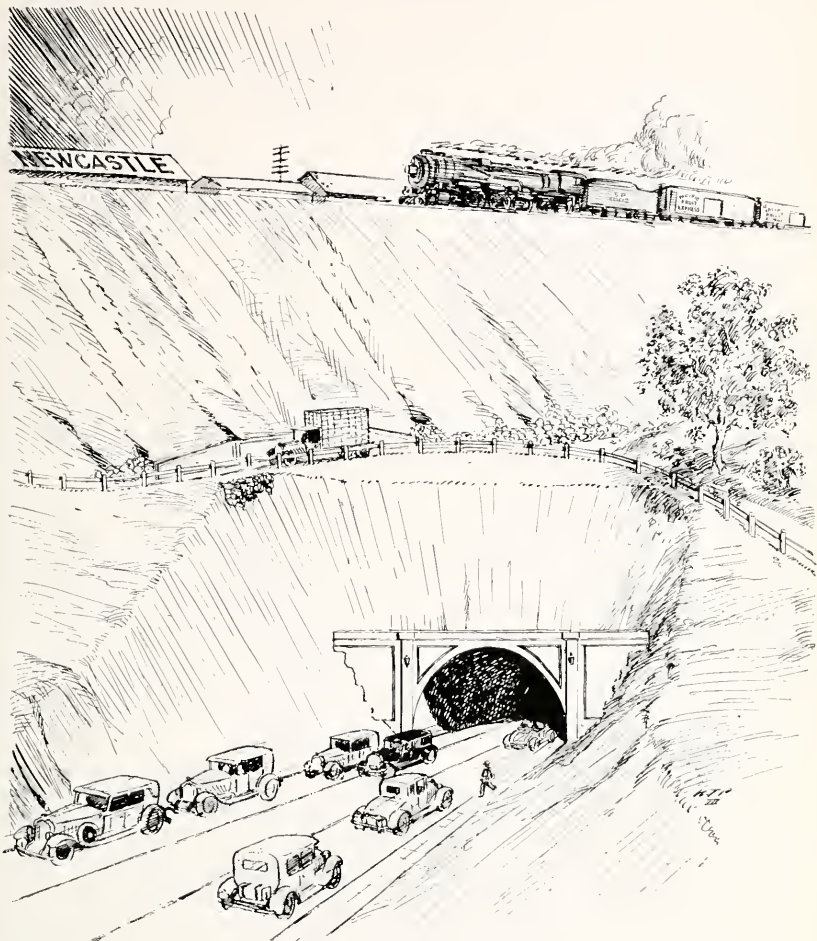
The total estimated cost of the project now under contract, 1.17 miles in length, is approximately \$225,000.

Work started on this project on September 2, 1930, and the date for completion is May 27, 1931.

The T. M. Morgan Paving Company is the contractor, C. H. Whitmore is district engineer, and J. W. Trask is resident engineer in immediate charge of the work under C. Cleman, district construction engineer.

THE SKETCH ON THE OPPOSITE PAGE

shows the new highway at Newcastle with its tunnel beneath the town. The lower map shows the beginning and ending of the project with reference to Newcastle.



Outdoor Christmas Trees For California's Highways

By JEAN SCOTT FRICKELTON

CALIFORNIA highways are winning fame throughout the nation as the "roads of Christmas-out-of-doors."

Not only are homes and public buildings transformed at Christmas time into the settings for scintillating outdoor living trees for everybody to enjoy, but our highways are becoming part of this general festive decoration plan, sponsored by an association of progressive and beauty-loving citizens.

Highway beautification has long been a popular cause, but stimulated by the Outdoor Christmas Tree Association of California, ambitious plans are now being made by many communities throughout the state which are destined to result in the planting of many miles of stately Christmas trees along the highways.

When the last outdoor Christmas tree campaign was launched for the 1929 holiday season, Clarence F. ("Sandy") Pratt of San Francisco, state president and founder of the association, interested the city of San Francisco in decorating and illuminating a "Mile of Living Christmas Trees" in the Panhandle of Golden Gate Park. Everybody knows the result. During the ten-night period that the colorful lights were turned on, thousands of motorists, thrilled with the beauty of this spectacle, came to admire and enjoy this great outdoor Christmas tree party.

These motorists were not San Franciscans alone, for as the news spread, Mesdames and Messrs. Sacramento, Salinas, San Jose, Fresno, Redding, Tulare and way points visited the site and put their official stamp of approval on the outdoor Christmas tree movement.

As a result, before Christmas had even arrived, the Outdoor Christmas Tree Association received word that Santa Cruz and Watsonville were hatching up a scheme to go San Francisco one bet-

ter and, instead of just one mile of trees, they were going to illuminate twenty miles of trees between the two cities, to form a mighty illuminated parade of giants of the forest whose fame would spread far and wide. The mayors of the two cities held frequent conferences and, although the twenty miles is still unaccomplished, the project has been started with the planting of two miles of trees extending out of Watsonville.

The popularity of the movement resulted in the Outdoor Christmas Tree Association's decision to incorporate into its activities this highway beautification plan by advocating that each town and city in California plant a mile of living Christmas trees along the highway leading into the city or along the main artery within the city. Thus tourists as well as residents would be able to enjoy California's outdoor Christmas, and between yuletide celebrations the trees would be enjoyed for their beauty and shade.

Soon service clubs, chambers of commerce, garden clubs, women's organizations, school children and various other groups began to communicate with the Outdoor Christmas Tree Association inquiring for instructions on highway planting or announcing plans for



An outdoor Christmas tree on the State Highway at Selma.

their own communities. The association decided to sponsor an arbor day to provide a uniform occasion for the planting of outdoor Christmas trees, and set aside March 7, which happened to be Luther Burbank's birthday, for this purpose.

Many towns throughout the state joined in with a vim. School children took part. Some even staged parades. The town of Gilroy was one of these, planting more than half a mile of trees on the Hecker Pass.

Some of the other communities who launched their "Mile of Living Christmas Trees" program during the year include South San Francisco, which is planning its mile on the highway near the railroad track so that tourists can enjoy the picture; Tulare on the Golden State Highway; Auburn and Lincoln on the Lincoln Highway; Sausalito at the end of the Redwood Highway; San Jose, with its mile of trees along The Alameda; Bakersfield along the Golden State highway toward Delano, and many others. Altadena, in southern California, has had its mile of Christmas trees for several years.

B. B. Meek, director of California Highways and a director in the Outdoor Christmas Tree Association, is of the opinion that the ideal way to plan highway beautification through Christmas trees is to place the trees in groups of a quarter or a half mile, instead of in one continuous line. This plan would present a series of inspiring pictures to the traveler.

As plans progress for the 1930 yuletide season, all indications point to an even greater public response to the tree-planting movement. With momentum growing yearly, California highways in future years are bound to provide a treat of natural beauty not only for our own citizens, but also for the throng of tourists who motor from one end of this state to another. California's highways are one of her greatest assets. When we unite in planting trees—particularly the universally beloved Christmas trees—along the edges, this state will have just cause for even more pride in its roads.

Despite an increased registration of motor vehicles and an increased number of fatalities due to motor vehicle operation in the country during 1929, fatalities in railway crossing accidents during the year were actually reduced 3 per cent according to the Grade Crossing Committee of the Association of Railway Claim Agents.

Two little boys came into the dentist's office. One said to the dentist: "I want a tooth took out, and I don't want no gas, because I'm in a hurry."

Dentist: "That's a brave little boy. Which tooth is it?"

Little boy: "Show him your tooth, Robert."

THE ARMY OF CIVIL ENGINEERS

By ALFRED DAMON RUNTAN

No hands are playing gaily when they're going into action.

No crowds are cheering madly at their deeds of derring-do;

They are owing small allegiance to any flag or faction—

Their colors on the sky-line and their war cry, "Put it through!"

Ahead of bath and Bible and of late repeating rifle,

The flags can only follow to the starting of their trail;

They herd the leagues behind them, every mile the merest trifle;

They mark the paths of safety for the slower sail and rail.

They work the Quite Impossible; they scoff the earth and water—

They've solved the problems of the air and found them easy, too.

They quell the ocean's raging, the mountain's fearful hauteur,

As they march toward the sky-line with the war cry, "Put it through!"

Their standards kiss the breezes from the Arctic's cooling ices

To where the South Pole's poking out its undiscovered head;

You can see their chains a-snaking through the lands of rum and spices

And East and West you'll always find their unrepining dead.

No time for love and laughter, with their rods upon their shoulders,

No time to think with vain regret of home or passing friends.

They are slipping down the chasms, charging up the mighty boulders.

The compass stops from overwork; the pathway never ends.

They slit the gullet of the earth, disgorge its hoarded riches

(But life's too short for them to stop and snatch a rightful share);

They've a booking on the Congo, putting in some water ditches;

A dating to take tea with death, they make it by a hair!

You will find their pickets watching in the unexpected places;

You will hear them talking freely of the Things-That-Can't-Be-Done;

Oh, the Faith they speak so strongly and the Hope that's in their faces—

It lights the gloom of What's-the-Use as brightly as the sun!

No hands are playing gayly and no crowds are madly cheering;

No telegraph behind them tells their deeds of derring-do;

But forward goes the legion, never doubting, never fearing—

Their colors on the sky-line and their war cry, "Put it through!"

IRRIGATION IN CALIFORNIA

(Continued from page 3.)

given such impetus to irrigation development in California as has the irrigation district law. This law confers on a farming community the right to organize into a self-governing corporate body, with the power of eminent domain, the power to tax all real property and the right to issue bonds to become a lien on all real property within the organized district. The purpose of such organization is to provide and distribute water for irrigating the lands in the district.

The first comprehensive California irrigation district law was passed in 1887, and was known as the Wright Act. In 1897 the Wright Act, which on the whole did not prove workable, was repealed by the enactment of the Bridgford Act. The latter act, through a great many amendments as well as through supplemental legislation, has developed into our present California irrigation district law. Under this law, certain state agencies are concerned in the major operations of organizing and financing irrigation districts. Organization is initiated through a petition to the county board of supervisors who, if they find the petition sufficient, refer the same to the State Engineer for investigation and report on the feasibility of the project. If such report is favorable the supervisors call an election at which the question of organization is decided by a majority of the ballots cast by those qualified by the general election laws of the state to vote in the district. Districts are governed by elective boards of directors, to whom the law delegates the management of all district affairs. Questions of incurring special indebtedness must be submitted to the voters, but in all other matters of internal management the directors have complete control.

IRRIGATION DISTRICT BOND COMMISSIONER

In 1913 the legislature passed the Irrigation District Bond Commission Act, creating a commission consisting of the Attorney General, the State Bank Superintendent and the State Engineer; this commission to be of service in financing irrigation districts should such service be requested. Bond elections may be authorized and called by directors of districts with the approval of the bond commission, or such elections may be called without the approval of the bond commission through petitions of a majority of the landowners, representing a majority of the assessed value of the land in the district. If it is desired that irrigation district bonds be certified by the

State Controller as legal investments for public funds, savings banks, etc., they must be submitted to and recommended by the bond commission for such certification. If bonds are certified, then all expenditures for funds realized from their sale are placed by law under the supervision of the bond commission. Districts can not legally enter into certain contracts without the approval of the commission.

Besides the many direct contacts with irrigation districts provided by law, the State Engineer acts as the agent of the bond commission in many of its relations with the districts. His office is required to investigate the feasibility of any proposed bond issues, to investigate, check and report on all plans submitted to the bond commission for expenditures on construction work or for any other proposed expenditures. It is also the state agency through which engineering investigations are made and through which expenditures approved by the bond commission are supervised.

DEVELOPMENT DURING BIENNIUM

While there has been little encouragement for the extension of agriculture during the present biennium, five petitions for the formation of new irrigation districts were received by the State Engineer. Three of these, involving a total area of about 40,000 acres, were approved and proceeded to organization. During the biennium, major transactions of irrigation districts with the State Engineer and the bond commission involved consent to the voting of bonds in the amount of \$640,000, the recommendation for certification of \$1,349,731, and the consent to the private sale of \$452,500, in bonds. Expenditures approved for irrigation districts amounted to \$1,528,623, and for water storage districts \$942,731, or a total approval by the bond commission, under the recommendation of the State Engineer, of \$2,471,354.

EIGHTY-NINE OPERATING DISTRICTS

There are now 89 districts actively operating under the California irrigation district law, all but seven of which have been formed since 1910. The total area embraced within the boundaries of these districts is 3,520,000 acres, and of the estimated total of 4,400,000 acres irrigated in California in 1930, more than two-fifths was contained within their boundaries. Twenty-one irrigation districts own or control reservoirs of a combined storage capacity of 1,150,000 acre-feet. Reliable data on the amount of water used by all districts are difficult to obtain, but 66

irrigation districts reported a total diversion of 6,366,000 acre-feet in 1929.

EXTENT OF BOND ISSUES

The financing of California irrigation districts has been largely through the sale of bonds. To January 1, 1930, the districts had sold \$108,326,221 in serial bonds, and of the total sold had retired \$11,234,339. The total financial transactions of irrigation districts during the year 1929 involved the payment of \$6,900,000 for bond interest, bond retirement and the retirement of other interest bearing obligations, and approximately \$4,600,000 for betterments and for the administration, operation and maintenance of their irrigation systems, a total of \$11,500,000, all from revenues derived from land taxes and water sales.

CONSERVATION DISTRICTS

In addition to the irrigation district act, California has passed several conservation district laws of general application, under which irrigation may form a part or the whole of the object of organization. Reclamation and drainage laws provide for the organization of districts for reclaiming swamp and overflowed lands and for any necessary irrigation of such lands after they are reclaimed. California has about 2,275,000 acres of land included in districts of this character, a considerable portion of which is farmed to crops requiring irrigation.

WATER STORAGE ACT

The California water storage district act authorizes the organization of districts whose primary purpose is to provide storage for irrigation. There are at this time two districts with a total area of 280,000 acres operating under this law.

There are 19 districts operating under the county water district act. These districts are organized by petition to county boards of supervisors and are under the jurisdiction of no state agency. Apparently the principal purpose for which most of such districts are formed is to supply domestic water to their residents, and it is estimated that only about 30,000 acres are irrigated under these organizations.

There are several other water conservation acts which were passed to meet special conditions or are of local application, but they have as yet served little or no part in the development of irrigation in California.

PATROL OFFICERS' DUTIES COVER RANGE FROM SAVING PURSES TO SAVING LIVES

(Continued from page 8.)

Vierling Kersey, State Superintendent of Public Instruction:

I want to report a splendid piece of cooperation on the part of the State Traffic Department with the adult evening school administration at Fortuna, and will appreciate it if your department will let the State Traffic Department know that we appreciate such splendid cooperation.

We held our opening night program and reception for adult evening school work last night and had sent out approximately 1000 invitations to adults in our school district. The response was wonderful. People came from all parts of the district to register, some traveling as far as twenty miles.

The State Traffic Department, under the able leadership of Inspector M. E. Brown of Eureka, by strange coincidence, set up a light raid at the entrance of town and stopped every car that came in, issuing tickets to those that had faulty lights. I felt that this was a poor reception for those people who were coming to attend our evening school reception and registration, hence I went to Inspector Brown and explained the situation to him. I also requested that they postpone their activities until a later date.

Inspector Brown very considerably assured me that they desired to cooperate with the evening school in every way, and promptly withdrew his force to a different locality or district for the rest of the evening. He further promised to assist us in every way possible at all times. We in turn have pledged 100 per cent cooperation with the State Traffic Department in a program of education and law enforcement.

Escorts Are Praised.

Many letters were received from organizations and communities to which the Highway Patrol had extended assistance either as escorts to caravans or as aids in handling crowds. William E. Metzger, secretary-manager of the San Joaquin Tourist and Travel Association, concludes such a letter with the following paragraph:

I am of the opinion that California State Motor Patrol under your guidance is the finest organization of its kind in the world. The men are intelligent, courteous, efficient and able to meet any emergency with the best of judgment.

INTERNATIONAL—When representatives of 50 or more governments met in the sixth international road congress in Washington, October 6-11, they were seated according to languages, and questions were translated at a central point and transmitted to the delegates through earphones. English, German, French and Spanish were used.

MASSACHUSETTS—State Department of Agriculture has developed a plan whereby tourists will be able to identify roadside stands which are sanitary and which sell quality products. Signs patterned after the New England quality products labels will be issued to stands complying with the state regulations.

Barber—Wet or dry, madam?

Lady—Never mind the politics, just comb my hair.

Industries and the
Salt Water Barrier



Water Studies in
Sacramento Valley

October Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Salinity Investiga-
tion Nears
Completion



Preparing For
New Snow Surveys

INDUSTRIES AND THE SALT WATER BARRIER

During the past month investigations and studies in connection with the salt water barrier have proceeded on the relations of the proposed barrier to the industrial development in the Bay region and to the agricultural development in the Delta and in the marsh land and upland areas contiguous to Suisun and San Pablo bays. A field survey was completed of the upland areas contiguous to Suisun and San Pablo bays, including all marginal lands from the marsh lands up to elevation 150 feet above sea level. This survey included the classification of the lands as regards crops, irrigation development, soil and adaptability and feasibility of irrigation and the necessity and desirability of additional water supply for irrigation. All available data in regard to the reclamation development in the Delta of the Sacramento and San Joaquin rivers have been gathered and are being compiled and analyzed with particular regard to the possible beneficial or detrimental effects of the barrier upon developments within this area. Preliminary studies have been started for the purpose of determining the feasibility and cost of furnishing water for irrigation and industrial uses by means of conduits extending from the Delta region down to the agricultural and industrial areas contiguous to Suisun Bay.

The intensive studies on the relation of the proposed salt water barrier to the industrial development in the upper San Francisco Bay area have been practically completed during the past month. Professor Geo. W. Dowrie, consulting economist from the Stanford Graduate School of Business, will shortly submit his final report to the special Industrial Economics Committee for final review and approval. This committee is composed of Professor W. E. Hotchkiss, dean of the Stanford Graduate School of Business, as chairman; Professor H. S. Grady, dean of the Graduate School of Business of the University of California; Mr. A. D. Schindler, consulting engineer of San Francisco.

This report contains the results of intensive investigations and studies of the economics of plant location in general and as directly applied to the San Francisco Bay region, the importance of water supply as a plant location factor in general and as directly applied to the San Francisco Bay region, the present magnitude and the past and future growth of the industries in the upper bay region, the relation of water costs to the present and future growth of industries in the upper bay region, and finally the possible economic advantages and benefits to the industries which might accrue from the construction of the proposed salt water barrier. The data obtained from the intensive survey of the industrial development have been of invaluable aid in carrying out this economic study on

the relation of industrial development to the proposed barrier. The cooperation and assistance of the industries in furnishing the basic data on the industrial development have largely contributed to the successful prosecution of this particular phase of the salt water barrier investigation. Substantially complete data on all of the industrials in the area affected by the proposed barrier have been obtained. Based upon the records furnished, complete data on the consumption and cost of water used by the industries have been compiled and analyzed. In addition, statistical data showing the past growth and present magnitude of the development have been compiled and analyzed for the purpose of estimating the future trend and growth of the industrial development.

GEOLOGICAL STUDIES

The special geological studies which have been under way by Professor C. F. Tolman, consulting geologist of Stanford University, have been completed and report submitted. These geological studies and report thereon include determinations of the geological formations and location of earthquake faults and all pertinent geological data related to the various sites proposed for the salt water barrier.

SEWAGE INVESTIGATION

The very detailed investigation and intensive study on sewage pollution and industrial wastes and the relation of the proposed salt water barrier thereto have been practically completed by Mr. C. G. Gillespie, chief engineer of the Bureau of Sanitary Engineering of the State Board of Health. The investigation has included the determination of all points and sources of pollution in the entire area affected from Sacramento and Stockton down to Richmond. Special pollution surveys have been made to determine the effect of sewage pollution and industrial wastes of various types on the quality and redeemability of the water. The report is now being prepared.

COOPERATIVE WORK

The cooperative work on the salt water barrier investigation under the direction of Colonel Thomas M. Robins of the U. S. Army Engineers has been proceeding on an intensive scale and substantial progress has been made. The work of the U. S. Army Engineers has involved detailed investigations and studies of the effect of the barrier on movement of silt and water borne debris in the rivers and bays and the effect on tidal action and tidal currents.

SACRAMENTO VALLEY INVESTIGATIONS

Estimates of the full natural and present impaired run-offs of all the minor streams in the Sacramento

Valley have been completed. Preliminary studies have been made for the Kennett reservoir and for the American River units operated to supply prior rights, salinity control and for an imported supply to the San Joaquin Valley. Studies to determine the economic installed capacities of power plants at the major reservoirs and the power output of the plants operated primarily for power have been completed for several of the units. Studies were completed for different methods of operating the upper Sacramento River units in combination with the Trinity River diversion to determine the relative value of each combination. Flood concentrations at five points in the Sacramento Valley have been determined for different sizes and frequencies of floods. Flood frequencies at the gaging stations have been completed for the major streams and studies have been initiated to determine the amount of space required in the major reservoirs to control floods to various magnitudes. Detail cost estimates have been completed for the major reservoirs in the Sacramento Basin and also for the Trinity River diversion, including costs of power plants. Annual costs for operating and maintaining these works have also been estimated. A report on the geology of the Sacramento Valley as related to the ground water storage has been prepared by Mr. Hyde Forbes, engineer-geologist. Measurements of depth to water on wells distributed throughout the Sacramento Valley floor have been continued during the month; 188 wells out of a total of 225 have been measured.

SAN JOAQUIN VALLEY INVESTIGATION

Examination and classification of all the mountain and agricultural land on the east side of the valley and north of the San Joaquin River have been completed. A map delineating the crop classification of 1929 has been completed. This is being used in determining the probable crop adaptability of the lands in the San Joaquin Valley and also in the study of the areas of deficient water supply. Maps of the ground water elevation of the upper San Joaquin Valley for all years of ground water observation, 1921 to 1929, were completed during the month. Maps of lines of equal total lowering of water table for the same period and of equal depth to water table as of October, 1929, were also completed for this area. Studies of the average seasonal inflow required to supply crop needs and maintain the position of the water table were completed for several hydrographic divisions of the upper San Joaquin Valley. Economic studies were completed during the month covering the following subjects:

1. Comparison of the economics of developing storage on the San Joaquin River at the Friant or at the Temperance Flat site.
2. The economics of the development of storage at the Friant site.
3. The economics of the utilization of the waters of the San Joaquin River with storage at Friant and canals diverting water northward to the Madera area and southward to the upper San Joaquin Basin. This study covers both the proposed initial development and the ultimate.
4. Economics of the proposed initial development as it affects the individual landowner in the upper San Joaquin Valley.

Cost estimates have been completed for reservoir development on the Kern River at Isabella and on San Joaquin River at Friant. A final layout with map and profile together with cost estimate has been com-

pleted for the San Joaquin River pump system using the San Joaquin channel to the mouth of the Merced River and thence following high ground on the west side to Mendota.

Preliminary studies completed and costs estimated of the feasibility of utilizing existing and artificial channels to connect the Sacramento River near Hood with the San Joaquin River at the mouth of the Mokelumne for the purpose of delivering Sacramento River water nearer to the center of demand in the Delta, to control salinity and to deliver water for export to the San Joaquin Basin.

OTHER INVESTIGATIONS

MOJAVE RIVER INVESTIGATION

During the month data for the progress report to complete the year's work up to September 30, 1930, were being collected.

It has become apparent that additional gaging stations must be established in order to complete the investigation. The run-off from the mountains is quite definitely established but the amount of water wasted by noneconomic vegetation above the lower rights is not known and the previous conception of the investigation could not be known until a year or two of sufficient high water to run through to the end of the river had occurred. By establishment of three new stations at a total cost of about \$1,300 it is believed that this can be determined in one year's time and report completed.

SOUTH COASTAL BASIN INVESTIGATION

This investigation is handicapped by lack of funds. An engineer was put in the field on October 1st with headquarters at Alhambra. He will get in touch with all those interests now measuring wells and prepare these data for publication. Numerous meetings have been held with various committees to organize the people of the area so that the information would be made available to this office. At the present time the expenditures should be proceeding at the rate of \$4,000 per month while actually expenditures are in the neighborhood of \$500 per month.

VENTURA COUNTY INVESTIGATION

Progress report for the past year is now being mimeographed for distribution to those interested.

ANTELOPE VALLEY INVESTIGATION

A reconnaissance was made of Antelope Valley to determine what could be done toward investigation. On October 14th a meeting was held with Los Angeles Chamber of Commerce which had promoted the investigation, and it was stated that the only work which this office could recommend would be consistent measurement of water levels at wells at a cost of approximately \$400 per year. The amount of water available to the valley is estimated to be between 80,000 and 100,000 acre-feet per year. It was stated that due to the physical situation there was no way by which closer estimate could be made without an unduly large expenditure and that it was felt that consistent measurement of wells would finally answer the same question much more cheaply. The Chamber of Commerce was advised that if funds were made available this year this office would undertake to keep up records on wells.

FIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month; plating of irrigated areas about 80 per cent completed.

SANTA CLARA AND NAPA COUNTY INVESTIGATION

Preparation of a progress report covering the year's work in Santa Clara County to September 1st continued throughout the month. The first season's field work in connection with the Napa County investigation was completed and preparation of a progress report for the year will start at once.

MISCELLANEOUS INVESTIGATIONS

Investigation of a water supply for proposed hospital site in the neighborhood of Camarillo in Ventura County was made. The water supply appears to be sufficient.

HOOVER-YOUNG COMMISSION, LEGISLATIVE WATER COMMITTEE

The ninth meeting of the Legislative Water Commission and Hoover-Young Commission convened at Hotel Oakland, Oakland, on September 22d and 23d. At this hearing, conducted as an executive session, deliberations of the above bodies were devoted to consideration of economic justifications for the development of the state-wide water resources plan. Federal benefits to be derived from these developments were weighed and reviewed. Comparisons were discussed for plans of construction of projects based on federal interest-bearing funds and federal interest-free funds. The tentative form and items of general policy for the composition of a constitutional amendment looking toward adoption of the state-wide water resources construction program were extensively discussed.

The tenth hearing of the fore-named bodies convened in executive session on October 6th and 7th, at Hotel Oakland, with an excellent attendance by members of both bodies. A summary of capital and annual costs for the development of the water resources projects of the great central valley was presented for study and discussion. Alternative programs of financing and construction were offered by members of the Legal Subcommittee of the Federal-State Commission.

SALINITY INVESTIGATION

During the past month a first draft of the report on salinity investigations has been completed. In connection with the report about 70 plates consisting of maps and diagrams and 50 tables summarizing the data and an analysis on the investigations and studies have been prepared. Relations have been established between the variation in advance and retreat of salinity and the basic factors of stream flow and tidal action which affect the same. The studies have resulted in the determination of the amounts of stream flow required to control salinity to various degrees and at various points in the Delta and upper bay region. The results of the investigation will be submitted to a special engineering advisory committee for complete review. Field work has been continued on the maintenance of 40 regular salinity observation stations and numerous automatic tide gage stations in the Bay and Delta regions.

IRRIGATION, WATER STORAGE DISTRICTS

The preparation and assembling of material for the report on irrigation district activities for the year

1929 has been completed and the manuscript transmitted to the State Printer for publication.

Visits were made during the present month to the Montague, Grenada, Big Springs and Scott Valley irrigation districts, located in Siskiyou County, to advise with their officers in connection with the maintenance and operation of these districts.

A hearing was held by the State Engineer at Hanford, on October 14th, in the matter of petitions for the exclusion of 1584 acres of land from the Tulare Lake Basin Water Storage District.

Officials of the Madera Irrigation District, located in Madera County, appeared before the California Bond Certification Commission for the purpose of discussing a proposed change in the plans of the district. This district proposes to proceed with its developments for which a bond issue was voted a number of years ago.

The California Bond Certification Commission approved a bond issue in the amount of \$175,000 for improvements and developments by the El Nido Irrigation District, located in Merced County. This district, recently organized, contains approximately 9000 acres and the purpose of the proposed bond issue is for raising funds for the construction of its irrigation system.

The bond commission also approved an agreement entered into between the Nevada Irrigation District and the Pacific Gas and Electric Company confirming previous agreements made between these parties.

DAMS

The activities of this department have been directed not only to studying and inspecting existing dams, but also much time has been spent on new construction and repairs which will be discussed in detail below.

To date 707 applications for approval of existing dams have been filed; 49 applications for approval of plans for the construction or enlargement of dams, and 66 applications for approval of plans for repair or alteration of dams.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OR ENLARGEMENT

Dam	Owner	County	Estimated cost
Hawkins	C. N. Hawkins	San Benito	\$3,000
Pine Canyon	City of Pasadena	Los Angeles	6,500,000
And Springs	Richard Talbot	Lassen	38,700
Peters Canyon	The Irvine Company	Orange	55,000

Application for approval of plans and specifications for Pine Canyon Dam was filed with the department on September 30 by the city of Pasadena. This is to be a huge concrete gravity structure 265 feet high and containing almost 700,000 cubic yards of concrete.

Because of the importance, magnitude and location of the proposed dam and the many involved technical features, the State Engineer has appointed a consulting board consisting of Chas. P. Berkey, professor of geology, Columbia University, New York City; N. Y.; Geo. D. Londerback, professor of geology, University of California; Ira A. Williams, consulting geologist, Portland, Oregon; J. L. Savage, chief designing engineer, U. S. Bureau of Reclamation, Denver, Colorado; George A. Elliott, consulting engineer, San Francisco; and M. C. Hinderlider, state engineer, Denver, Colorado, to investigate and report upon the safety features of the structure.

These nationally known consultants, possessing unquestioned ability and integrity, are preeminently qualified and widely experienced in their respective professions. They are to complete an intensive examination of the site of the proposed work and com-

prehensively review all technical phases of the proposed dam. The results of their investigation, together with their conclusions, will be embodied in a report to the State Engineer upon the safety features of the dam.

This board consists of the same members who last November reported to the state regarding the proposed Forks dam on the San Gabriel, a few miles above the Pine Canyon site, and are therefore already generally familiar with San Gabriel area.

The Pine Canyon Dam will also be under the jurisdiction of the U. S. Forest Service, and the federal department, through Mr. E. W. Kramer, regional engineer, will cooperate with the state in the investigation.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR REPAIRS OR ALTERATIONS

Twenty-three such applications have been received during this period in line with the endeavor of the owners and of this department to get all dams in shape for final approval.

PLANS APPROVED FOR CONSTRUCTION

Dam	Owner	County
Whittier Reservoir No. 4	City of Whittier	Los Angeles
Tiger Creek	Pacific Gas and Electric Company	Anaheim

PLANS APPROVED FOR REPAIRS AND ALTERATIONS

Fourteen applications of this nature were approved by the State Engineer.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Aside from clearing of second growth timber in the by-pass, only routine maintenance work has been carried on in connection with the flood control project. An average of 25 men have been employed during this period.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

Two tree current retards have been constructed on the left bank of the Sacramento River at Twenty Mile Bend, in cooperation with Reclamation District No. 70, at a cost of \$4,200.

Bank protection work in cooperation with Reclamation District No. 317 has been undertaken on the San Joaquin River side of Andrus Island. The work is approximately one-third complete and consists of rebuilding the levee and facing it with rock rip-rap for a distance of 3500 feet. The dredger *Trojan* and one dragline machine are at work and approximately 6000 tons of rip-rap rock will be placed. The estimated cost is \$23,500.

Approximately 500 tons of rock additional have been deposited on the Brannan Island protection on the Sacramento River opposite Rio Vista, in cooperation with Reclamation District No. 2067.

In cooperation with the Division of Highways and Reclamation District No. 556, bank protection work is being installed on the left bank of the Sacramento River on Andrus Island, two miles below Ryde. The estimated cost of this work is \$2,300.

SACRAMENTO FLOOD CONTROL PROJECT

An average of 70 men have been engaged during the period in clearing in the Sutter-Butte Slough and Tisdale by-passes and two camps have been in opera-

tion. Clearing work on the Feather River bottom near Marysville under five contracts is 97 per cent complete, three of the contracts being entirely finished. Considerable detail work has been done in connection with the flood control construction program for the current fiscal year and various surveys have been made in this connection. The deputy in charge of flood control and reclamation attended two meetings of the Reclamation Board and one meeting of the construction committee of the Flood Control Association.

SANTA MARIA RIVER

The work of clearing the channel of the Santa Maria River near Guadalupe was commenced on September 22, 1930, and has continued with a force of 50 men under D. W. Roberts. This work is in cooperation with the counties of Santa Barbara and San Luis Obispo.

RUSSIAN RIVER JETTY

The funds available for the construction of the jetty at the mouth of the Russian River have been exhausted and the work was discontinued on October 11. The south jetty is well toward completion and lacks only about 10,000 tons of rock to finish. The condition of the jetty is fairly good and it will withstand ordinary winter storms. The channel has remained open.

NAVARRO RIVER JETTY

The rock jetty at the mouth of the Navarro River, constructed for the Division of Fish and Game, was completed on October 1, 1930, under contract by Christie and Allen at a cost of \$5,250. The bar was opened after the completion of the jetty.

SALINAS RIVER

It is expected to have the work of opening the channel of the Salinas River into Elkhorn Slough completed by October 30. The barge for the transportation of equipment has been completed, and it is expected to move the machine in on October 20.

During the period since September 15, 1930, an average of 145 men have been employed on the above work exclusive of contractor's employees.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

During the month of September twenty-five applications to appropriate water were received, sixteen were canceled and twenty-five were approved. Seven permits were revoked and two licenses were issued.

Among the applications received of more than ordinary interest are those by C. M. Salyer to appropriate for mining purposes from South Fork of Trinity River in Trinity County at an estimated cost of \$91,000, the application of Western Pacific Railroad Company to appropriate from Potato Slough, a tributary of South Fork of Mokelumne River, in San Joaquin County, for industrial purposes, at an estimated cost of \$11,500, and the application of El Nido Irrigation District to appropriate from Deadman and Dutchman creeks, tributaries of San Joaquin River, in Merced County, for irrigation purposes, at an estimated cost of \$135,000.

Permits of more than ordinary interest issued during the month are those approving the applications of C. Fred Holmes et al., to appropriate from East Dredger Cut of Sutter By-pass, in Sutter County, for the irrigation of 1897 acres at an estimated cost of \$15,000 and the application of Santa Carbona Irrigation District to appropriate from San Joaquin

River, in San Joaquin County, for irrigation purposes at an estimated cost of \$334,000.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the superior court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the superior court of Riverside County awaiting development in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Submission of referee's final report still being withheld pending negotiations now in progress toward settlement of one of the important issues.

Oak Run Creek (Shasta County). Case pending in superior court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in the superior court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the superior court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County). Negotiations relative to a consent judgment being carried on.

Mill Creek (Modoc County). Administration of the tentative schedule of allotments which was authorized for the 1930 season was completed October 1st.

Deep Creek (Modoc County). The field investigation of water supply and use of water was completed October 1st.

Franklin Creek (Modoc County). The field investigation of water supply and use of water was continued throughout the month. A survey of the lands irrigated from the stream was completed during the month.

WATER DISTRIBUTION

Water master service on *Little Shasta River and Lower Shasta River (Siskiyou County)*, *North Cow, Oak Run and Clover creeks (Shasta County)*, *Davis, Emerson, Mill, Owl and Soldier creeks (Modoc County)*, and *West Fork of Carson River (Alpine County)*, was discontinued for the season October 1st. Water master service on *Hat and Burney creeks, both in Shasta County*, was discontinued for the season on October 10th.

Pit River (Modoc and Lassen Counties). Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River investigation. Considerable work was done by the water users, under the supervision of the resident engineer, in the repair of the dams along the river in order to increase the efficiency of the water distribution next season.

CALIFORNIA COOPERATIVE SNOW SURVEYS

The work in the past month has been almost entirely in the field. Trips have been made to make the necessary arrangements for the surveys in the coming season, such as the proper stocking of shelter cabins, distribution of equipment and discussion of plans with cooperating agencies and the personnel to be used on the surveys.

On a trip through Yosemite Park, all snow courses were marked with the new State-U. S. Department of the Interior signs and one course was relocated.

At Fresno, arrangements were made with the San Joaquin Light and Power Corporation for the North Kings surveys.

At Hume, plans were completed with the city of Los Angeles for the Middle and South Kings surveys. New snow courses at Bullfrog Lake and Copper Creek Summit are contemplated for the 1931 surveys.

At General Grant Park and Hanford, the cooperation with the General Grant Park and Tulare Lake Water Storage District for South Kings surveys was worked out.

At Sequoia National Park, new snow courses were located at Panther and Hockett in the Kaweah Basin and at Quinn Ranger Station Meadow in the Kern Basin. These courses and the one at Giant Forest will be surveyed monthly, January to May, through the cooperation with the Sequoia National Park.

In Lassen Volcanic National Park, arrangements were completed for the construction and stocking of shelter cabins at Lake Helen and Supan Springs, and certain of the snow courses were marked with pipe standards.

The relocated Haskins Flat course near Bucks Reservoir was signed.

In the Stanislaus Basin new snow courses to be surveyed through cooperation with the Pacific Gas and Electric Company were located and marked at Soda Creek Flat, Lower Relief Valley and Eagle Meadows.

In the Carson and Mokelumne basins, arrangements were made for stocking the regular shelter cabins.

In the San Joaquin Basin, the Florence Lake course was relocated.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued. The field work has been devoted chiefly to the annual census of irrigated crops and areas under all diversions measured throughout the Delta region.

Field and office work has been done to determine the segregation of San Joaquin return water as to districts and certain stretches of the river.

Salinity investigations have been continued with the maintenance of sampling at forty-six stations in the Bay and Delta areas. Six regular tide gage stations have been maintained and recently, upon the withdrawal of the army engineers from field work, the maintenance of the Benicia, Antioch and Collinsville tide gages has been taken over.

The following are comparative data for 1929 and 1930:

Station	Salinity in parts of Chlorine per 100,000	
	October 2, 1930	October 2, 1929
Bullhead Point	1,090	1,230
O. & A. Ferry	400	660
Collinsville	250	410
Antioch	225	365
Jersey	48	170
Emmatt	—	119
Webb Pump	14	40
Rio Vista	2	3
Isleton	2	2

Station	Discharge in second-feet	
	October 8, 1930	October 8, 1929
Sacramento River at Sacramento	6,850	5,450
San Joaquin River near Vernalis	1,720	1,490
Combined flow to delta	8,570	6,940

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON OCTOBER 29th

C. H. PURCELL, Chief of Division of Highways.

The following statement summarizes the work of the Division of Highways since September 23d, when the September report was made to the Governor's Council:

Work placed under contract.....	\$962,900
Contracts pending and projects advertised.....	1,052,100
Work in process, anticipated to be advertised during the coming month.....	1,781,000

Total\$3,796,000

CONTRACTS COMPLETED

During the same period contracts on construction of state highways have been completed and work accepted on a number of projects, including the following:

SAN DIEGO-EL CENTRO LATERAL

Three miles of Portland cement concrete pavement, 20 feet wide, have been placed on the San Diego-El Centro lateral in Imperial County from the Myers Creek bridge to three miles west of Coyote Wells; the cost was \$131,300. This improvement on the route connecting the Imperial Valley with the coast at San Diego was placed on the roadbed which was built following the destruction of the old paved road by the flood of December, 1926. The new highway is well up on the mountain side and will be safe from damage by future storms.

DESERT GAP BRIDGED

The extension of modern highway construction on one of the most traveled transcontinental roads has bridged another gap across the desert in San Bernardino County. This project covers nearly twenty miles of the interstate highway which enters southern California at Needles and via San Bernardino. The work extended from two miles west of Argos to one and one-half miles west of Siberia and consisted of grading and placing an oil treated crushed rock surface, twenty feet wide. The usual method of desert construction was used, with protection to the roadbed against damage by cloudbursts in the form of an adequate system of ditches and dikes which parallel the highway and carry flood waters into large cross channels. This new desert highway carries the improvement, which was recently completed, from Daggett to Siberia and there connects with the 51 miles now under construction as far as Essex. The cost of the twenty miles just completed amounted to \$400,000.

COAST ROUTE BETTERMENT

The paving of over eleven miles of the important Coast Route connecting Los Angeles and San Francisco has been completed, comprising the four miles between Zaca and Wignmore in Santa Barbara County and from the Santa Maria River north to Los Berros Creek in San Luis Obispo. On these two sectors the

roadbed was widened and straightened and the old fifteen-foot concrete pavement has been replaced with a modern reinforced concrete slab twenty feet wide. The total cost of these two projects was \$397,500, and their improvement has brought to modern standards of highway construction two of the few remaining old stretches of this heavily traveled artery.

ANGELS CAMP-BIG TREES HIGHWAY

In Calaveras County, 15.5 miles of the mountain highway from Angels Camp to Markleeville has had the old base thickened and widened to a uniform width of 15 feet from Murphy's to Big Trees and is now being given a bituminous surface treatment by state forces. The cost of reconstructing the base and stockpiling the screenings for the surface treatment amounted to \$18,200. When completed this improvement will give a satisfactory mountain road from Angels Camp to Big Trees, making a safe and smooth highway to this popular resort for both summer vacationists and those wishing to enjoy winter sports.

REDWOOD HIGHWAY PROJECTS

The continued improvement of the Redwood Highway, which extends from San Francisco through the beautiful redwood groves along the coast to the Oregon line, is noted by the completion of five projects at various points along its route.

In Marin County the two miles from San Rafael to Gallinas Creek was constructed on a new alignment around the hills north of San Rafael. The new road is surfaced with bituminous macadam over the fills and with Portland cement concrete pavement on the portions which are not subject to settlement. An overhead grade separation across the tracks of the Northwestern Pacific Railroad was constructed at Forbes Station. This new routing eliminated some exceptionally bad alignment of adverse grades and blind curves and shortened the road between these two points by 1600 feet.

In Humboldt County two needed improvements have been made between Loleta and Beatrice. An underpass beneath the tracks of the Northwestern Pacific Railroad was constructed at Loleta and the five miles from Loleta to two miles north of Beatrice was reconstructed to present day standards of alignment and grade with an adequate screened gravel surfacing. An overhead crossing is now under construction across the railroad at the north end of this project.

From Garberville to Bluff Creek, a mile of poor alignment along the Eel River has been replaced by a modern highway with easy grades and large radius curves surfaced with twenty-two feet of untreated crushed rock.

A substantial base for future surfacing has been placed from Smith River to Patrick's Creek in Del Norte County on that portion of the Redwood Highway between Crescent City and Grants Pass, Oregon. Fifteen miles of untreated crushed rock, from four

inches to six inches in thickness and from eighteen feet to twenty feet wide, comprised this improvement.

The total expenditures of these five projects on this coastal route amounted to \$338,500.

RED BLUFF-SUSANVILLE LATERAL

The completion of the last unimproved gap on the lateral between Red Bluff and Susanville is noted by the construction of the four and one-half miles between Goodrich and Coppervale in Lassen County. This work consisted of constructing a graded roadbed and placing crushed rock surfacing twenty feet wide. Traffic on this section is largely local travel between Westwood and Susanville, but it is now expected that through traffic from Red Bluff to Susanville will materially increase due to the improvement over the entire length of the lateral. The cost of this last improvement was \$77,000.

PROJECTS ON WHICH BIDS WERE OPENED

Important projects for which bids were opened during the past month include the following:

GRADE SEPARATIONS

A project for placing a forty-foot Portland cement concrete pavement through the grade separation which is now being built by the Pacific Electric Railway at its crossing of the Foothill Boulevard near Malaga street, eight miles west of San Bernardino. The construction of this subway will be a much needed safety factor on this heavily traveled road, as the old grade crossing has been the scene of many accidents, some of which have resulted in fatalities. The cost of the pavement at this structure will be \$36,800.

CASTAIC CREEK CROSSING

On the Los Angeles-Sacramento highway, just south of the Ridge Route, the road is to be reconstructed on a new alignment at its crossing of Castaic Creek. A reinforced concrete girder bridge is now under construction on the new location replacing the old existing bridge which was built on an alignment unfitted for present day high speed traffic. The new routing will have a roadbed of 36 and 40 feet wide and will be paved with 20 feet of Portland cement concrete. Costing \$44,900 this project is another improvement of this artery which runs through the heart of the state.

COAST ROUTE WORK

The extensive improvement of the Coast Boulevard between Long Beach and Newport Beach was given further impetus when bids were opened for the construction of a 326-foot timber bridge across Alamitos Bay on the new alignment of this route between Anaheim street in Long Beach and Seal Beach. The construction of the roadway and a bridge across the San Gabriel River on this new location is now under way. The cost of the Alamitos Bay bridge will be \$53,100.

SANTA MARIA RIVER BY-PASS

To be constructed at a cost of \$25,000 a low level by-pass road across the old channel of the Santa Maria River and overflow channel of the Cuyama River is necessitated by the recent failure of one span of the old county bridge across the Santa Maria River in Santa Barbara County about one-half mile north of Santa Maria. The by-pass, while consisting of a twenty-foot Portland cement concrete pavement on a standard 36-foot roadbed, is only of a temporary nature and the permanent improvement of this sector

of the important Coast Route will be carried out in the near future.

BAY SHORE PROJECTS

The steady progress of construction on the Bay Shore Highway is evidenced by the opening of bids on two projects and the advertising of a third. The recently graded roadbed constructed across low marsh lands between San Mateo and Redwood City is to have a bituminous treated surface 42 feet wide, placed on the heavy fill and to serve until final settlement of the embankment has taken place, at which time a four-lane Portland cement concrete pavement will be laid. The cost of surfacing this 7.3 miles will be \$134,900. At the southerly end of this project a four-span reinforced concrete girder bridge 127 feet long, with a 76-foot roadway and two twelve-foot sidewalks, is to be constructed across Redwood Slough at an estimated cost of \$43,000. This project was advertised for bids on October 1, 1930. The second project for which bids were opened was for the placing of a 40-foot Portland cement concrete pavement in the city of South San Francisco, and will cost \$97,500. The work will be the final stage of construction on the section of the Bay Shore Highway from the northerly city limits of South San Francisco to the grade separation under the tracks of the Southern Pacific Railroad. The paving on the five miles south of the subway is now under way.

BRIDGE WIDENING WORK

As a factor for greater adequacy and added safety on the heavily traveled artery between the bay region and Sacramento is the widening of five concrete bridges between Vacaville and Dixon in Solano County. The existing bridges were built some 15 to 18 years ago by the county, before present day high speeds had influenced highway construction. The improvement will bring the bridges from 18 or 20 feet in width to 28 feet of clear roadway, at a cost of \$12,000.

LINCOLN HIGHWAY ALIGNMENT

On the Lincoln Highway, just west of Placerville, is an improvement of far-reaching interest as the realignment of this portion of the Sacramento-Placerville lateral has long been a necessity. To cost \$97,600, the project calls for the placing of 22 feet of untreated crushed gravel or stone surfacing on a standard 36-foot graded roadbed. The new alignment is between Clark's Corners and Placerville, a distance of nearly two miles, and will eliminate the existing hairpin turns and materially improve the grade on this westerly approach to "Old Hangtown." The project includes the construction of a bridge across Hangtown Creek.

PACIFIC HIGHWAY CONSTRUCTION

In Colusa County the second stage of the ultimate improvement of the West Side Pacific Highway is to be constructed on the eight miles between Williams and Maxwell. The work will consist of placing a gravel base 33 to 39.5 feet wide over the recently graded roadbed which was constructed to the west of the existing pavement. The present improvement, to cost \$100,700, is preparatory to placing the new pavement, which will be the third and final stage of the highway reconstruction between these towns.

PROJECTS ADVERTISED

Among the more important projects advertised during the past four weeks are the following:

DESERT HIGHWAY WORK

The continued improvement of the desert lateral from El Centro to San Bernardino will be pushed forward by the reconstruction of that portion of this route from the Arroyo Salado to the northerly boundary of Imperial County. The new road will be built to a higher grade than the existing one, so as to give proper drainage and an adequate system of side ditches is to be constructed to protect the roadbed from damage by the severe desert storms. An asphalt concrete pavement 20 feet wide will be placed on a standard 36-foot roadbed section. The high volume of traffic, including much produce trucking, using this route between the Imperial Valley and the metropolitan area surrounding Los Angeles, necessitates the highest type of highway and improvement of the route to modern standards is being made as rapidly as is possible.

MANHATTAN BEACH BRIDGE

An improvement on the Coast Boulevard as it passes through Manhattan Beach, in Los Angeles County, will be the construction of a reinforced concrete girder bridge 135 feet long, and 60 feet wide with two five-foot sidewalks over the tracks of the Atchison, Topeka and Santa Fe Railroad. This overhead structure is being built in conjunction with the grading and paving of this route through Manhattan Beach, which is now in progress under a contract let by the city of Manhattan Beach.

CHOLAME LATERAL IMPROVEMENT

At the crossing of the Cholame Pass lateral with the tracks of the Atchison, Topeka and Santa Fe Railroad at Wasco, in Kern County, the railroad is now constructing a concrete and steel grade separation and the state has now advertised for bids on the grading and paving with Portland cement concrete the highway through the underpass. This construction is a unit in the improvement of this lateral, which connects the coast route at Paso Robles with the valley route at Famoso, just to the north of Bakersfield.

MARIN REALIGNMENT

Three miles of the Redwood Highway are to be constructed on new alignment between Alto and Waldo, in Marin County. This project is the southerly portion of a new location on this popular route from San Rafael to Sausalito, and will materially shorten the distance between these two cities as well as eliminate the difficult Corte Madera grade. The present improvement will consist of constructing a graded roadbed 46 feet and 56 feet wide and placing a bituminous macadam pavement 30 and 40 feet wide. The new routing crosses the tracks of the Northwestern Pacific Railroad and an arm of Richardson's Bay. This crossing will be effected by the construction of a bridge, which will be advertised for bids in the near future.

FEATHER LATERAL BRIDGE

A project of difficult proportions will be the construction of a steel cantilever bridge across the deep gorge of the beautiful canyon of the North Fork of the Feather River at Pulga in Butte County. The erection of this structure is to be accomplished by two contracts, one comprising the placing of the reinforced concrete abutments and piers and the other entailing the erection of the steel cantilever and anchor arm superstructure. Advertisements for bids on the substructure were published October 22, and the superstructure will be advertised in a week or two. This project is located on the Oroville to Quincy lateral, which is being constructed on a new alignment.

The grading of the adjoining roadway to the south of the bridge and along the precipitous slopes of the canyon side is now under way. The bridge will swing high above the river, crossing over the bridge of the Western Pacific Railroad and carrying the highway to the solid rock wall on the east side of the canyon where future road work will lead the route up the river.

OCTOBER REPORT OF
DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

MOTOR VEHICLE REGISTRATION SHOWS INCREASE

As of October 1, the Division has registered the following number of vehicles as to classification:

Automobiles	1,897,807
Solid trucks	15,299
Pneumatic trucks	79,778
Motorcycles	8,973
Solid trailers	9,321
Pneumatic trailers	36,957
Transfers	435,375

In every classification excepting solid tire truck equipment an increase is noted over 1929. The total fees collected is \$9,320,590.78.

As of October 1, the Division has issued 66,186 nonresident permits. We have also registered 36,656 exempted automobiles, motorcycles and trailers; 139,664 chauffeur licenses have been issued as of October 1.

HIGHWAY PATROL ACTIVITIES

During the past month the men patrolling the highways covered a total mileage of 672,402 miles.

During September, 13,860 stops were made in light tests and 6094 persons arrested.

The Bureau of Brakes examined and submitted for approval during the last month 100 applications for brake adjusting stations and 210 adjusters. At the present time the Division feels that a sufficient number of stations have been authorized to handle the cars cited in our enforcement program and a number of applicants have been advised to this effect. Practically all arrangements have been completed for the enforcement of the brake laws in Los Angeles and should be put in effect in a few weeks. The Los Angeles Police Department has expressed a desire to operate along the lines of the California Highway Patrol in the matter of retesting and allowing a certain period of time for a courtesy campaign before imposing fines. To date there are 1177 authorized brake adjusting stations and 2635 adjusters.

During the month of September, 42,444 applications were received for operators' licenses. Of this number 34,597 were issued. Some were temporarily rejected. One applicant was permanently rejected as incompetent.

PATROL SCHOOL NOW AT MATHER FIELD

On August 4, the California Highway Patrol school moved to new quarters at Mather Field. The first class at Mather Field completed their course of instructions October 1, and on October 4, the second class reported and completed their instructions October 17. We have found the new quarters ideal in almost every way. The health of the men in the last two classes has been excellent, which we attribute in a large measure to the location of the school.

HIGHWAY BIDS AND AWARDS

For Month of October

SAN MATEO COUNTY—Through South San Francisco about 0.9 of a mile to be graded and paved with Portland cement concrete. Dist. IV, Rt. 68, Sec. A. W. A. Dantanville, Salinas, \$104,365; Hanrahan Co., San Francisco, \$89,487; N. M. Ball, Porterville, \$96,600. Contract awarded to Basich Bros. Const. Co., Torrance, \$89,162.50.

SANTA BARBARA COUNTY—About $\frac{1}{2}$ mile north of Santa Maria, 0.6 of a mile to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. A. Maceo Const. Co., Clearwater, \$33,764; Santa Maria Const. Co., Santa Maria, \$26,227. Contract awarded to Cornwall Const. Co., Santa Barbara, \$22,362.

SAN BERNARDINO COUNTY—At Malaga Street, about 0.3 of a mile to be paved with Portland cement concrete. Dist. VIII, Rt. 9, Sec. A. Matich Bros., Elsinore, \$34,523; F. W. Teschke, Los Angeles, \$33,319; George Gardner & Sons, Redlands, \$33,362. Contract awarded to Martin Green, San Bernardino, \$32,389.70.

LOS ANGELES COUNTY—Bridge across Alamitos Bay near Long Beach. Fifteen 19-ft. timber spans with concrete deck and one 41-ft. 4-inch steel beam removable span. Dist. VII, Rt. 60, Sec. F. J. F. Knapp, Oakland, \$51,945; Oberg Brothers, Los Angeles, \$58,726; Gist & Bell, Arcadia, \$51,799; R. R. Bishop, Long Beach, \$54,682; Merritt, Chapman & Scott, San Pedro, \$55,190. Contract awarded to Carpenter Bros., Inc., Beverly Hills, \$50,545.40.

COLUSA COUNTY—Between Bear Creek and 8 miles west of Williams, construction of new property fence. Dist. III, Rt. 15, Sec. D. A. Mitchell, Sacramento, \$11,499; California Wire Cloth Co., Oakland, \$12,044; B. C. Burnett, Turlock, \$10,970; Standard Fence Co., Oakland, \$11,997; Anchor Post Fence Co., San Francisco, \$8,447. Contract awarded to G. E. McDaniel, Marysville, \$7,843.

LOS ANGELES COUNTY—At Castaic Creek, about 1 mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 4, Sec. A. McCray Co., Los Angeles, \$41,916; Kovacevich & Price, Inc., South Gate, \$43,421; Gibbons & Reed Co., Burbank, \$45,724; Southwest Paving Co., Los Angeles, \$50,450; Griffith Company, Los Angeles, \$45,130. Contract awarded to F. W. Teschke, Hollywood, \$39,544.

SAN MATEO COUNTY—Between San Mateo and Redwood City, 7.3 miles to be surfaced with bituminous treated crusher run base. Dist. IV, Rt. 68, Sec. C. Healy-Tibbitts Const. Co., \$181,639; Fred W. Nighbert, Bakersfield, \$209,792; Clyde W. Wood, Stockton, \$130,530; Peninsula Paving Co., San Francisco, \$151,970; Granite Const. Co., Watsonville, \$179,615; V. R. Dennis Const. Co., \$163,328; W. A. Dontanville, Salinas, Cal., \$181,389; Basich Brothers Const. Co., Torrance, \$143,169; N. M. Ball, Porterville, \$142,337; C. Mankel, Sacramento, \$173,215; Jack Casson, Hayward, \$163,189; Hemstreet & Bell, Marysville, \$151,691; M. J. Nevada, Stockton, \$144,421. Contract awarded to Fredrickson & Watson, Oakland, \$120,819.75.

DEL NORTE COUNTY—Construction of Maintenance Yard Building at Idelwild, about 9 miles south of Oregon line. Dist. I, Rt. 1, Sec. E. Mercer Fraser Co., Eureka, \$16,700. Contract awarded to Oliver S. Almlie, Crescent City, \$13,868.

HUMBOLDT COUNTY—At High Rock Hill on the Redwood Highway, 0.4 of a mile to be graded and surfaced with untreated gravel. Dist. I, Rt. 1, Sec. D. I. V. Galbraith, Petaluma, \$21,759; Hemstreet & Bell, Marysville, \$16,289; Engelhart Paving Const. Co., Eureka, \$16,617. Contract awarded to Chigris & Sutcos, San Francisco, \$15,020.20.

HUMBOLDT COUNTY—Construction of Maintenance Yard buildings at Garberville. Dist. I, Rt. 1, Sec. A. Smith Bros. Co., Eureka, \$12,237; J. R. Evans, Garberville, \$14,600; Oliver S. Almlie, San Francisco, Louis Halvorsen, Santa Rosa, \$11,841; Mercer-Fraser Co., Eureka, \$13,750. Contract awarded to McCarthy & Johannis, San Francisco, \$10,648.

PLACER COUNTY—Truck shed 80' x 30' and gas and oil house at Roseville Maintenance Station. Dist. III, Rt. 17, Sec. A. W. E. Truesdale, Sacramento, \$4,669; C. J. Hopkinson, Sacramento, \$4,697; Campbell Construction Co., Sacramento, \$4,168; G. E. McDaniel, Marysville, \$5,932; Wilke & Tropper, Roseville, \$4,794; Henry A. Dewing, Walnut Grove, \$5,000. Contract awarded to Yoho & Daugher, Sacramento, \$3,900.

SOLANO COUNTY—Widening to 28 feet 5 existing bridges between Vacaville and Dixon. Dist. X, Rt. 7, Sec. D. Ralph Hunter, Sacramento, \$18,713; P. F. Bender, North Sacramento, \$12,614. Contract awarded to George J. Ulrich, Modesto, \$11,462.95.

IMPERIAL COUNTY—Between Arroyo Salado and north county boundary, 13.1 miles to be graded and paved with asphalt concrete. Dist. VIII, Rt. 26, Sec. DE. Central Cal. Road Co., Los Angeles, \$583,454; V. R. Dennis Const. Co., San Diego, \$544,473; H. W. Rohl Co., Los Angeles, \$549,411; Basich Brothers Const. Co., Torrance, \$575,571; Hanrahan Co., San Francisco, \$499,584; Peninsula Paving Co., San Francisco, \$534,971; George R. Curtis Paving Co., Los Angeles, \$597,795; Gibbons & Reed Co., Burbank, \$549,682; Chas. V. Heuser, Glendale, \$571,072; Clark & Henry Const. Co., San Francisco, \$532,485; Allied Contracting Co., Inc., Omaha, Neb., \$670,749; New Mexico Const. Co., Inc., Albuquerque, N. M., \$552,207; Griffith Co., Los Angeles, \$544,400; Geo. H. Oswald, Los Angeles, \$551,415; Southwest Paving Co., Los Angeles, \$521,596. Contract awarded to R. E. Hazard Contracting Co., San Diego for \$489,125.

HUMBOLDT COUNTY—Removing and replacing timber lift span of the bridge across Eureka Slough at Eureka. Dist. I, Rt. 1, Sec. GII. Fred Maurer & Son, Eureka, \$5,393; Henry Padgett, Fiddlers Landing, \$4,870; Mercer-Fraser, Eureka, \$6,134; Contract awarded to Smith Bros., Eureka, \$4,247.24.

SANTA BARBARA COUNTY—Timber bridge to replace collapsed span across the Santa Maria River. Dist. V, Rt. 2, Sec. A. Santa Maria Const. Co., \$5,432; San Atlas Const. Co., San Luis Obispo, \$5,683; Maceo Const. Co., Clearwater, \$6,100; Greene Const. Co., Los Angeles, \$6,236; Silveria & Robbiss, Ventura, \$6,293; Cornwall Construction Co., Santa Barbara, \$6,368; Theo. M. Maino, San Luis Obispo Co., \$6,906. Contract awarded to William Lane, Paso Robles, \$4,998.60.

The officer had laid violent hands on the drunk who stood on the corner. Finally the drunk got angry.

"Shay," he said, "I've a good notion to punch you again."

"Again?" asked the cop. "Why, you haven't done it the first time."

"Well," replied the drunk, "I had the same notion before."—*Kreolite News*.

DIVISION OF ARCHITECTURE

Awards for Month of October

CALIFORNIA STATE BUILDING, Los Angeles: Contracts for general work awarded to Weymough Crowell Co., Los Angeles, \$635,800; plumbing work to Pacific Pipe and Supply Co., Los Angeles, \$47,673; ventilating work to J. Herman Co., Los Angeles, \$16,850; structural steel to Consolidated Steel Corp., Los Angeles, \$128,775; heating work to Lohman Brothers, Los Angeles, \$33,383; electrical work to H. H. Walker, Los Angeles, \$48,894; granite work to McGilvray Raymond Corp., Los Angeles, \$65,985; elevators to Consolidated Steel Corp., Los Angeles, \$47,900.

HUMBOLDT STATE TEACHERS COLLEGE, Arcata: Contract for putting in a 6-inch sewer main from Gymnasium Building to connect with city sewer system, awarded to A. Brizard, Inc., of Arcata, \$2,736.

ALMANOR FISH HATCHERY, Chester: Contract for buildings to Red River Lumber Company of Westwood, \$14,618.

STATE NARCOTIC HOSPITAL, Spadra: Contract for general work on Ward Buildings Nos. 1 and 2. Receiving Ward Building, and Auditorium Building, to John Strona of Chino, \$38,990; contract for plumbing, heating and ventilating work to Thomas Haverly Co. of Los Angeles, \$9,840; contract for electrical work to R. R. Jones Electric Co., South Pasadena, \$1,300.

DAM APPLICATIONS, AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

SIERRA COUNTY—Smith Lake Dam No. 287. Mrs. J. C. Knickram, Blairsden, owner; rockfill, 4 feet above streambed with a storage capacity of 100 acre-feet, situated on Smith Creek tributary to Feather River, in Sec. 30, T. 22 N., R. 12 E., M. D. B. and M., for storage purposes, for domestic and irrigation use.

NEVADA COUNTY—Island Lake Dam No. 61512. Nevada Irrigation District, Grass Valley, owner; rock and earth, 11½ feet above streambed with a storage capacity of 330 acre-feet, situated on Canyon Creek tributary to South Yuba River in Sec. 27, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

NEVADA COUNTY—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earthfill, 10 feet above streambed with a storage capacity of 72 acre-feet, situated on South Fork Canyon Creek tributary to S. Yuba River, in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

NEVADA COUNTY—Crooked Lake Dam No. 61-14. Nevada Irrigation District, Grass Valley, owner; rock and earthfill, 10 feet above streambed with a storage capacity of 11 acre-feet situated on South Fork Canyon Creek tributary to South Yuba River in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

LASSEN COUNTY—Diversion Dam No. 237-5. Red River Lumber Co., Westwood, owner; timber and earth dam, 12 feet above streambed with a storage capacity of 20 acre-feet, situated on Hamilton Branch tributary to North Fork Feather River in Sec. 14, T. 28 N., R. 8 E., M. D. B. and M., for diversion purposes, for power use.

SAN MATEO COUNTY—Dennis Martin Creek Dam No. 610. A. Schilling, Woodside, owner; earth dam, 20 feet above streambed with a storage capacity of 9.95 acre-feet, situated on Dennis Martin Creek tributary

to Searsville Lake, located in Rancho Canada de Raymundo, for storage purposes, for recreation use.

PLUMAS COUNTY—Long Lake Dam No. 286. Ed Burke, Blairsden, owner; rock dam, 5½ feet above streambed with a storage capacity of 1200 acre-feet, situated on Frazier Creek tributary to Feather River in Sec. 1, T. 21 N., R. 11 E., M. D. B. and M., for storage purposes, for irrigation and power use.

SIERRA COUNTY—Gold Lake Dam No. 286-2. Ed Burke, Blairsden, owner; rock dam, 4 feet above streambed with a storage capacity of 1200 acre-feet, situated on Frazier Creek tributary to Feather River in Sec. 16, T. 21 N., R. 12 E., M. D. B. and M., for storage purposes for irrigation use.

PLACER COUNTY—Quail Lake Dam No. 326. D. H. Chambers, Chambers Lodge, owner; rockfill dam, 6 feet above streambed with a storage capacity of 17 acre-feet, situated on Quail Lake tributary to Lake Tahoe in Sec. 12, T. 14 N., R. 16 E., M. D. B. and M., for storage purposes for domestic, irrigation and power use.

MODOC COUNTY—Duke Reservoir No. 163. Royal E. Williams, Likely, owner; earth dam, 10 feet above streambed with a storage capacity of 20 acre-feet, situated on drainage tributary to Pit River in Sec. 9, T. 39 N., R. 13 E., M. D. B. and M., for storage purposes, for irrigation and stock use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

LASSEN COUNTY—Mud Springs Dam No. 240. Richard Talbot, Portland, Oregon, owner; earth dam, 21½ feet above streambed with a storage capacity of 13,000 acre-feet, situated on Deep Creek tributary to Clear Creek in Sec. 35, T. 31 N., R. 16 E., M. D. B. and M., for storage and diversion purposes for irrigation use. Estimated cost, \$36,700; fees paid \$367.

ORANGE COUNTY—Peters Canyon Dam No. 793-2. Irvine Company, Tustin, owner; earth dam, 41 feet above streambed with a storage capacity of 1030 acre-feet, situated on Peters Canyon in Block 16, Irvine's Subdivision, for storage purposes, for irrigation use. Estimated cost, \$55,000; fees paid, \$550.

AMADOR AND CALAVERAS COUNTIES—Tiger Creek Afterbay Dam No. 97-105. Pacific Gas and Electric Company, San Francisco, owner; arch dam, 85 feet above streambed with a storage capacity of 3800 acre-feet, situated on North Fork tributary to Mokelumne River in Sec. 23, T. 7 N., R. 13 E., M. D. B. and M., for diversion purposes for power use. Estimated cost \$1,200; fees paid \$20.

SHASTA COUNTY—Digger Dam No. 222. G. L. Childs and A. P. Waller, Mantion, owners; earth dam, 22 feet above streambed with a storage capacity of 34 acre-feet, situated on a dry ravine tributary to Digger Creek in Sec. 18, T. 30 N., R. 1 E., M. D. B. and M., for storage purposes, for recreation use. Estimated cost, \$2,517; fees paid, \$25.17.

SAN MATEO COUNTY—Dennis Martin No. 2 Dam No. 610-2. A. Schilling, Woodside, owner; earth dam, 16 feet above streambed with a storage capacity of 8.54 acre-feet, situated on Dennis Martin Creek tributary to Searsville Lake in Rancho Canada de Raymundo, for storage purposes, for recreation use. Estimated cost \$1,200; fees paid \$20.

SISKIYOU COUNTY—Kathriner Dam No. 186. Frank Kathriner, Weed, owner; hydraulic fill dam, 25.9 feet above streambed with a storage capacity of 322 acre-feet, situated on Haystack Draw tributary to Whitney Creek in Sec. 27, T. 43 N., R. 4 W., M. D. B. and M., for storage purposes, for domestic and irrigation use. Estimated cost, \$9,000; fees paid, \$90.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

NEVADA COUNTY—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rock dam situated on Canyon Creek tributary to South Yuba River in Sec. 17, T. 18 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Sawmill Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; rock dam situated on Canyon Creek tributary to South Yuba River in Sec. 11, T. 18 N., R. 12 E., M. D. B. and M.

MODOC COUNTY—Plum Canyon Dam No. 139. Alice I. Porter and John Page, Alturas, owners; earth

dam situated on Plumb Canyon tributary to Parker Creek in Sec. 32, T. 42 N., R. 14 E., M. D. B. and M.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown Willamette Paper Company, San Francisco, owner; crib dam situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

LASSEN COUNTY—Nelson Dam No. 231. Fred S. Benedict, Likely, owner; earth dam situated on Dry Creek tributary to Pit River in Sec. 24, T. 38 N., R. 12 E., M. D. B. and M.

INYO COUNTY—Tinemaha Dam No. 6-26. City of Los Angeles, Los Angeles, owner; earth dam, situated on Owens River in Sec. 25, T. 10 S., R. 34 E., M. D. B. and M.

NEVADA COUNTY—Faucheur Dam No. 61-5. Nevada Irrigation District, Grass Valley, owner; timber dam, situated on Canyon Creek tributary to S. Yuba River in Sec. 13, T. 18 N., R. 12 E., M. D. B. and M.

MODOC COUNTY—Bonde Dam No. 124. M. H. Payne, Merrill, Oregon, owner; earth dam, situated on Antelope Drainage tributary to Tule Lake in Sec. 27, T. 47 N., R. 6 E., M. D. B. and M.

LASSEN COUNTY—Antelope Dam No. 242. Pierre Ducasse, Termo, owner; earth dam, located in Sec. 3, T. 34 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Upper Roberts Dam No. 157. H. M. Roberts, Lookout, owner; earthen, situated on Antelope Drainage tributary to Pit River in Sec. 29, T. 40 N., R. 7 E., M. D. B. and M.

MODOC COUNTY—Lower Roberts Dam No. 157-2. H. M. Roberts, Lookout, owner; earthen, situated on Antelope Drainage tributary to Pit River in Sec. 11, T. 39 N., R. 7 E., M. D. B. and M.

MODOC COUNTY—Payne Dam No. 143. H. G. Payne, Alturas, owner; earth dam situated on unnamed drainage tributary to E. Fk Pitt River in Sec. 15, T. 41 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on S. Fk Canyon Creek tributary to S. Yuba River in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M.

MARIPOSA COUNTY—Mountain King Dam No. 95-11. San Joaquin Light and Power Corporation, Fresno, owner; gravity, situated on Merced River tributary to San Joaquin River in Sec. 1, T. 4 S., R. 17 E., M. D. B. and M.

BUTTE COUNTY—Lost Creek Dam No. 63-2. Oroville-Wyandotte Irrigation District, Oroville, owner; arch dam, situated on Lost Creek tributary to S. Fk Feather River in Sec. 24, T. 20 N., R. 7 E., M. D. B. and M.

SANTA CLARA COUNTY—Lake Ranch Dams A and B No. 622. San Jose Water Works, San Jose, owner; earthen, situated on Beardsley Creek tributary to Los Gatos Creek in Sec. 23, T. 8 S., R. 2 W., M. D. B. and M.

YUBA COUNTY—Lake Francis Dam No. 97-3. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Dobbins Creek tributary to Yuba River in Sec. 5, T. 17 N., R. 7 E., M. D. B. and M.

SIERRA COUNTY—Upper Sardine Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owners; rock and earth, situated on Sardine Creek tributary to N. Fk Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. B. and M.

LOS ANGELES COUNTY—Mulholland Dam No. 6-17. City of Los Angeles, Los Angeles, owner; concrete gravity, situated on Weid Canyon in Sec. 3, T. 1 S., R. 14 W., S. B. B. and M.

SAN BERNARDINO COUNTY—Bear Valley Dam No. 803. Bear Valley Mutual Water Company, Redlands, owner; multiple arch, situated on Bear Creek tributary to Santa Ana River in Sec. 22, T. 2 N., R. 1 W., S. B. B. and M.

ALAMEDA COUNTY—Dingee Dam No. 31-14. East Bay Municipal Utility District, Oakland, owner; earth dam situated on unnamed draw, located at Estates drive and Euclid's drive, Oakland.

SIERRA COUNTY—Huntington Flat Dam No. 331-2. Loftus Blue Lead Mines Co., Los Angeles, owner; earth dam, situated on no stream in Sec. 7, T. 21 N., R. 10 E., M. D. B. and M.

SIERRA COUNTY—Mose Emery Dam No. 331-3. Loftus Blue Lead Mines Company, Los Angeles, owner; earth dam, situated on gulch tributary to Cedar Grove Ravine in Sec. 12, T. 21 N., R. 9 E., M. D. B. and M.

SIERRA COUNTY—Gardner's Point No. 331-4. Loftus Blue Lead Mines Company, Los Angeles, owner; earth dam situated on no stream in Sec. 13, T. 21 N., R. 9 E., M. D. B. and M.

SONOMA COUNTY—Lawler Reservoir No. 581-3. California Water Service Company, San Francisco, owner; earth, situated on North Creek tributary to Adobe Creek in Sec. 12, T. 5 N., R. 7 W., M. D. B. and M.

SANTA CLARA COUNTY—Lower Howell Dam No. 622-2. San Jose Water Works, San Jose, owner; earth, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

SANTA CLARA COUNTY—Upper Howell Dam No. 622-3. San Jose Water Works, San Jose, owner; earth, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

MODOC COUNTY—Little Juniper Dam No. 136. G. M. and J. E. Clark, Alturas, owners; earth, situated on little Juniper Creek tributary to Pit River in Sec. 4, T. 40 N., R. 13 E., M. D. B. and M.

PLACER AND NEVADA COUNTIES—Van Geisen Dam No. 61-9. Nevada Irrigation Districts, Grass Valley, owner; arch dam situated on Bear River tributary to Yuba River in Sec. 2, T. 13 N., R. 8 E., M. D. B. and M.

LASSEN COUNTY—Lake Leavitt Dam No. 236-2. Lassen Irrigation District, Standish, owner, earth dam located in Sec. 15, T. 29 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—James Flat Dam No. 121. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Mosquito Creek tributary to Willow Creek in Sec. 25, T. 47 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Ess Ex Dam No. 121-2. S. X. Ranch, Alturas, owner; earth, situated on Salsbury Creek tributary to Pit River in Sec. 6, T. 42 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Huffman-Antelope Dam No. 121-3. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Antelope Plains tributary to Pit River in Sec. 11, T. 43 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Willow Creek Flat Dam No. 121-4. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Willow Creek tributary to Clear Lake in Sec. 24, T. 46 N., R. 10 E., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

LOS ANGELES COUNTY—Whittier Reservoir No. 4/18-2. City of Whittier, Whittier, owner; earthen, 543 feet above streambed with a storage capacity of 32.3 acre-feet, situated on a foothill canyon tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. B. and M., for storage purposes for municipal use.

AMADOR COUNTY—Tiger Creek Dam No. 97-104. Pacific Gas and Electric Company, San Francisco, owner; slab and buttress, 100 feet above streambed with a storage capacity of 540 acre-feet, situated on Tiger Creek tributary to N. Fk Mokelumne River in Sec. 8, T. 7 N., R. 14 E., M. D. B. and M., for regulating purposes, for power use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown Willamette Paper Company, San Francisco, owner; crib dam, situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

MODOC COUNTY—Plum Canyon Dam No. 139. Alice I. Porter and John Page, Alturas, owner; earth, situated on Plum Canyon tributary to Parker Creek in Sec. 32, T. 42 N., R. 14 E., M. D. B. and M.

LASSEN COUNTY—Nelson Dam No. 231. Fred S. Benedict, Likely, owner; earth, situated on Dry Creek tributary to Pit River in Sec. 24, T. 38 N., R. 12 E., M. D. B. and M.

INYO COUNTY—Tinemaha Dam No. 6-26. City of Los Angeles, Los Angeles, owner; earth, situated on Owens River in Sec. 26, T. 10 S., R. 34 E., M. D. B. and M.

MODOC COUNTY—Bonde Dam No. 124. M. H. Payne, Merrill, Oregon, owner; earth, situated on Antelope Drainage tributary to Tule Lake in Sec. 27, T. 47 N., R. 6 E., M. D. B. and M.

MODOC COUNTY—Kelley & Greiner Dam No. 133. L. McHugh and Geo. L. Dewey, Alturas, owners; earth and rock dam.

SHASTA COUNTY—North Battle Creek Dam No. 97-96. Pacific Gas and Electric Company, San Francisco, owner; rockfill dam situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. B. and M.

LASSEN COUNTY—Antelope Dam No. 242. Pierre Ducasse, Termo, owner; earth dam situated on Madeleine Plains in Sec. 3, T. 34 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Upper Roberts Dam No. 157. H. M. Roberts, Lookout, owner; earth, situated on Antelope River tributary to Pit River in Sec. 29, T. 40 N., R. 7 E., M. D. B. and M.

NEVADA COUNTY—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek tributary to S. Yuba River in Sec. 17, T. 18 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Cantrall Dam No. 140. Charlotte Cantrall, Alturas, owner; earth dam, situated on a ditch tributary to Pine Creek in Sec. 33, T. 42 N., R. 13 E., M. D. B. and M.

BUTTE COUNTY—Lost Creek Dam No. 63-2. Oroville-Wyandotte Irrigation District, Oroville, owner; arch dam situated on Lost Creek tributary to S. Fork Feather River in Sec. 24, T. 20 N., R. 7 E., M. D. B. and M.

SIERRA COUNTY—Upper Sardine Lake Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owners; rock and earth dam, situated on Sardine Creek, tributary to North Fork Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. B. and M.

BUTTE COUNTY—Magalia Dam No. 73. Paradise Irrigation District, Paradise, owner; earth dam situated on Little Butte Creek tributary to Sacramento River in Sec. 25, T. 23 N., R. 3 E., M. D. B. and M.

SIERRA COUNTY—Huntington Flat Dam No. 331-2. Loftus Blue Lead Mines Co., Los Angeles, owner; earth, located in Sec. 7, T. 21 N., R. 10 E., M. D. B. and M.

EDWARD HYATT, State Engineer.

November 1, 1930.

WATER APPLICATIONS AND PERMITS

Applications for permit to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of October, 1930.

STANISLAUS COUNTY—Application 6810. Turlock Irrigation District, c/o R. V. Meikle, Chief Eng., Turlock, California, for 800 c.f.s. from Tuolumne River tributary to San Joaquin River to be diverted in Sec. 16, T. 3 S., R. 14 E., M. D. B. and M., for power purposes.

STANISLAUS COUNTY—Application 6811. Turlock Irrigation District, c/o R. V. Meikle, Chief Eng., Turlock, California, for 800 c.f.s. from Tuolumne River tributary to San Joaquin River to be diverted in Sec. 16, T. 3 S., R. 14 E., M. D. B. and M., for domestic purposes. Estimated cost, \$50,000.

TULARE COUNTY—Application 6812. A. E. Stegeman, Posey, California, for .022 c.f.s. from an unnamed spring tributary to Bull Run Creek to be diverted in Sec. 36, T. 24 S., R. 31 E., M. D. B. and M., for recreational purposes. Estimated cost, \$200.

SANTA CRUZ COUNTY—Application 6813. Theodore J. Hoover, Swanton, California, for 5 c.f.s. from Battle Creek tributary to the Pacific Ocean to be diverted in Sec. 35, T. 9 S., R. 4 W., M. D. B. and M., for irrigation purposes. Estimated cost, \$2,500.

SAN BERNARDINO COUNTY—Application 6814. The Metropolitan Water District of Southern California, 222 South Hill St., Los Angeles California, for 15,000 c.f.s. and 717,000 a.f. from Colorado River Tributary to the Pacific Ocean to be diverted in Sec. 4, T. 2 N., R. 27 E., S. B. B. and M., for power purposes. Estimated cost, \$20,000,000.

RIVERSIDE COUNTY—Application 6815. Charles A. Buck, P. O. Box 111, Banning, California, for 0.25 m.f. from an unnamed spring tributary to Whitewater River Watershed to be diverted in Sec. 7, T. 4 S., R. 2 E., S. B. B. and M., for irrigation and domestic purposes. Estimated cost, \$175.

HUMBOLDT COUNTY—Application 6816. George H. Bergin, Weaverville, California, for 150 c.f.s. from Cedar Creek and Horse Linto Creek tributaries to Trinity River to be diverted in Sections 29 and 8, T. 7 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$150,000.

EL DORADO COUNTY—Application 6817. H. A. Linthicum and W. D. Meyers, 137 Carmel Ave., Roseville California, for 400 g.p.d. from an unnamed stream tributary to S. Fk. of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost, \$200.

ILLUMAS COUNTY—Application 6818. Victor Challen, c/o Cooper Challen Reed Co., Inc., 7 West Santa Clara St., San Jose, California, for 1.0 c.f.s. from Clear Creek tributary to Butt Creek, thence N. Fk. Feather River to be diverted in Sec. 27, T. 25 N., R. 7 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$100.

EL DORADO COUNTY—Application 6819. H. L. Fowler, Georgetown, California, for 12 c.f.s. from Pilot Creek tributary to Rubicon River, thence Middle Fork American River to be diverted in Sec. 4, T. 12 N., R. 12 E., M. D. B. and M., for irrigation purposes.

SISKIYOU COUNTY—Application 6820. Mrs. Elia E. George, Cecilville, California, for 50 c.f.s. from E. Fk. of Six Mile Creek tributary to E. Fk. of S. Fk. of Salmon River to be diverted in Sec. 11, T. 39 N., R. 10 W., M. D. B. and M., for mining purposes. Estimated cost, \$5,000.

LOS ANGELES COUNTY—Application 6821. Gus Wissendorf, Swartout, California, for 13 c.f.s. from Mine Gulch tributary to Frairle Fork, thence San Gabriel River to be diverted in Sec. 17, T. 3 N., R. 8 W., S. B. B. and M., for mining and domestic purposes.

MODOC COUNTY—Application 6822. Bidwell Electric Co., c/o C. H. Aldridge, owner, Fort Bidwell, California, for 1.0 c.f.s. from Harper Creek tributary to Bidwell Creek to be diverted in Sec. 6, T. 46 N., R. 16 E., M. D. B. and M., for power purposes. Estimated cost, \$1,000.

AMADOR COUNTY—Application 6823. Frank Du Bois, 2951 First Ave., Sacramento, California, for 0.04 c.f.s. from Crystal Spring (formerly Twin Spring) tributary to N. Fk. of Tuolumne River to be diverted in Sec. 31, T. 7 N., R. 12 E., M. D. B. and M., for mining and domestic purposes. Estimated cost, \$1,000.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of October, 1930.

EL DORADO COUNTY—Permit 3579, Application 6727. Issued to Ira W. Kibby, Sacramento, Cal., October 1, 1930, for 0.01 c.f.s. from an unnamed spring in Sec. 15, T. 11 N., R. 17 E., M. D. M., for domestic use.

MONO COUNTY—Permit 3580, Application 6686. Issued to C. E. Brodie, Los Angeles, Cal., October 1, 1930, for 0.01 c.f.s. from Dry Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic use. Estimated cost \$175.

MERCED COUNTY—Permit 3581, Application 6603. Issued to J. L. Firpo and J. Caraglio, Cressey, Cal., October 2, 1930, for 4 c.f.s. from Merced River, in Sec. 35, T. 5 S., R. 12 E., M. D. M., for irrigation on 329.7 acres. Estimated cost \$2,200.

MERCED COUNTY—Permit 3582, Application 6479. Issued to C. L. Schmidt, Gustine, Cal., October 2, 1930, for 0.31 c.f.s. from Dry Creek in Sec. 13, T. 5 S., R. 12 E., M. D. M., for irrigation on 25 acres. Estimated cost, \$500.

SAN BERNARDINO COUNTY—Permit 3583, Application 6695. Issued to Robert S. Irwin, Lucerne Valley, Cal., October 3, 1930, for 0.5 c.f.s. from two unnamed springs in Sec. 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic on 40 acres. Estimated cost \$3,000.

RIVERSIDE COUNTY—Permit 3584, Application 6623. Issued to O. J. McMahan, Idyllwild, Cal., October 17, 1930, for 0.02 c.f.s. from an unnamed stream in Sec. 4, T. 7 S., R. 3 E., S. B. M., for irrigation and domestic use on 10 acres. Estimated cost, \$2,000.

EL DORADO COUNTY—Permit 3585, Application 6730. Issued to Mrs. Ida Raught et al. Kyburz, Cal., October 17, 1930, for 0.002 c.f.s. from an unnamed spring in Sec. 30, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

MONO COUNTY—Permit 3586, Application 6547. Issued to Gladys Koebig, Los Angeles, Cal., October 17, 1930, for 240 g.p.d. from small unnamed stream in Sec. 17, T. 4 S., R. 27 E., M. D. M., for domestic use. Estimated cost \$90.

AMADOR, CALAVERAS COUNTIES—Permit 3587, Application 5128. Issued to East Bay Municipal Util.

ity Dist., Oakland, Cal., October 18, 1930, for 375 c.f.s. and 50,000 acre-feet from Mokelumne River in Sec. 26, T. 5 N., R. 10 E., M. D. M., for power use.

COLUSA COUNTY—Permit 3588, Application 6672. Issued to Colusa Development Co. of Colusa, Cal., October 21, 1930, for 9.87 c.f.s. from Sacramento River in Sec. 25, T. 14 N., R. 1 E., M. D. M., for irrigation on 789.7 acres. Estimated cost \$20,000.

COLUSA COUNTY—Permit 3689, Application 6696. Issued to J. W. Browning, Grimes, Cal., October 21, 1930, for 5.95 c.f.s. from Sacramento River in Sec. 6, T. 14 N., R. 1 E., M. D. M., for use for irrigation on 476.2 acres. Estimated cost \$6,690.

STANISLAUS COUNTY—Permit 3590, Application 6574. Issued to J. M. de Souza, Modesto, Cal., October 21, 1930, for 9.41 c.f.s. from Tuolumne River, in Sec. 12, T. 4 S., R. 7 E., M. D. M., for irrigation on 33 acres. Estimated cost, \$1,500.

NEVADA COUNTY—Permit 3591, Application 5876. Issued to Spanish Mining Co., San Francisco, Cal., October 25, 1930, for 15 c.f.s. from Poorman's Creek in Sec. 31, T. 18 N., R. 11 E., M. D. M., for use for power. Estimated cost, \$11,000.

LASSEN COUNTY—Permit 3592, Application 5812. Issued to G. L. Kramer Bieber, Cal., October 25, 1930, for 6.75 c.f.s. from Widow Valley Creek in Sec. 31, T. 39 N., R. 7 E., M. D. M., for irrigation and stock watering on 540 acres. Estimated cost, \$3,000.

SAN BERNARDINO COUNTY—Permit 3593, Application 4807. Issued to Water Conservation Association of Riverside, Cal., October 25, 1930, for 250,000 acre-feet per annum storage from Santa Ana River in Sec. 4, T. 1 S., R. 2 W., S. B. M., for use for irrigation and domestic on 52,640 acres. Estimated cost, \$100,000.

COLUSA COUNTY—Permit 3594, Application 6760. Issued to M. E. Hastings, Maxwell, Cal., October 27, 1930, for 1.0 c.f.s. from Stone Corral Creek in Sec. 33, T. 17 N., R. 3 W., M. D. M., for use for irrigation on 81 acres.

INYO COUNTY—Permit 3595, Application 6724. Issued to Burnham Chemical Co., Westend, Cal., October 28, 1930, for 0.007 c.f.s. from Parsons and Barnett canyons in Secs. 28 and 34, T. 23 S., R. 42 E., M. D. M., for use for industrial and domestic purposes. Estimated cost \$10,000.

SAN BERNARDINO COUNTY—Permit 3596, Application 6736. Issued to Raymon M. Hart of Pine Knot, Cal., October 28, 1930, for 0.014 c.f.s. from an unnamed spring in Sec. 28, T. 12 N., R. 1 E., S. B. M., for irrigation, domestic, and fox raising. Estimated cost, \$500.

SUTTER COUNTY—Permit 3597, Application 6527. Issued to J. T. Cummins Ranch Co. of Knights Landing, Cal., October 28, 1930, for 5.96 c.f.s. from Sacramento River in Sec. 1, T. 12 N., R. 1 E., M. D. M., for irrigation on 476.75 acres. Estimated cost, \$7,000.

MONO COUNTY—Permit 3598, Application 6692. Issued to Henry Heyman, Long Beach, Cal., October 29, 1930, for 200 g.p.d. from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic use. Estimated cost \$200.

TRINITY COUNTY—Permit 3599, Application 6752. Issued to Charles Roderic Delaney, Forest Glen, Cal., October 29, 1930, for 2.5 c.f.s. from Little Rattlesnake Creek in Sec. 17, T. 1 S., R. 8 E., M. D. M. for mining and domestic purposes. Estimated cost, \$100.

JAPAN BANS GRADE CROSSING CLAIMS

While American railroads continue the expenditure of millions of dollars annually on safety devices and educational work to prevent grade crossing accidents, the supreme court of Japan has approached the solution of the problem from an altogether different angle.

"In the future," it is reported in a recent issue of the Japan Advertiser, published in Tokio, "the motorist who races trains to crossings will do so at his own risk. His heirs will have no claim on any railway company, public or private, if his temerity sends him on a journey he had not expected to take so immediately.

"The new ruling," the article continues, "is a recognition of the fact that this is an age of speed and that the country will be benefited more by faster train schedules than by preserving the lives of idiots who race trains to crossings."

NIGHT DRIVING

Big yellow headlights coming down the road,
Little red tail lights, each one with a load;
Whirring of the motor—bang! goes the exhaust.

Hurry, for each minute lagged is a minute lost.

Run up the speedometer—never mind the law—

Pass that poky driver—he's the worst I ever saw!

An extra shot of gasoline, see her waste the oil—

Watch the motometer red—almost at a boil.
Lots of miles behind us—just a few to make—

And we'll beat the record by the risks we take.
Aw, what's the use of rushing, now we trail a truck

On a twisting mountain road—doggone the luck!

—ADRIA S. HARRISON.

THE ROAD OF YESTERDAY

By WILLIAM FELTER

Along the Road of Yesterday
The ox-wain creaked across the plain.
'Twere men of vision blazed the trail,
Or else today had dawned in vain.
A cabin stands beside the road.
Its crumbling walls gone to decay.
Who knows its story? Who can tell
When love and laughter passed this way?

Along the Road of Yesterday
Came caravans for golden gain;
The wrecks still strew the desert sand,
Their bones lie bleaching on the plain.
Who knows what failure or success
Rewarded effort? Who can say
Who faltered? Who at last won through
Uncharted Roads of Yesterday?

For now great highways gird the plain
That once was trackless. Cities sprang
Like magic at Industries' touch—
The whistles shrilled, the school bells rang.
Though sand has drifted o'er the bones
Of those who perished on the way,
Those who won through built monuments
Along the Road of Yesterday.

Sister—Was Maude in a bright red frock at the dance?

Brother—Some of her, darling, some of her.

"Do you know how to find the horse power of a car?"

"No."

"Easy—just lift the hood and count the plugs."—
oil Weekly.

STATE OF CALIFORNIA

Department of Public Works

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B. B. MEEK.....Director

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DIVISION OF PORTS

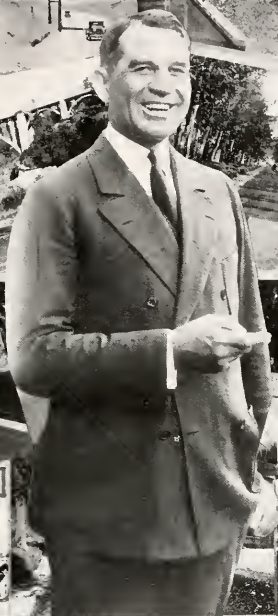
Port of Eureka—F. B. Barnum, Supervisor
Port of San Jose—Not appointed
Port of San Diego—Edgar A. Luce

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO, 1930

California Highways and Public Works



Official Journal of the Department of Public Works
State of California

DECEMBER

1930

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A Message From the Director

By B. B. MEEK, Director of the Department of Public Works

IN THE first issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS, I wrote to the members of the Department of Public Works as follows:

THE THOUGHT that I would convey to every official and every employee of the Department of Public Works in this, the first issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS, is that YOU form the BUILDING branch of the state government of California.

To be a builder is a great thing.

To be a BUILDER OF CALIFORNIA should be sufficient to enthral the imagination, arouse the ambition and enlist the energy and the efforts of every one to whom has been given the privilege of such service.

For IT IS a privilege to have an active part in building California into the great commonwealth that geography and nature both intended it to become.

And as the privilege is great, so is the responsibility.

To those of us to whom is now entrusted the responsibility of building the highways of the state; of developing its water resources; of planning, designing and constructing its public buildings, the thought should ever come that if we do our work well, the prosperity, the well being, the happiness of the people of this state for centuries to come will reflect the fact that our service was well and honorably performed.

And it is in these terms of human value that I would ask those who are connected with the department to view their tasks.

When pouring concrete or spreading asphalt, we are building not roads alone, but we are also building happiness, contentment, comfort, patriotism and loyalty into the lives of a whole people.

And so it is with every activity of every division of this department. It is PEOPLE whom we are building and not things. * * *

The department is entitled to your best and independent judgment on all matters that affect your work here. This is no place for "Yes-men" or "Amen-ers."

We must be willing, yes anxious, to work with others, knowing that the job is too big for any one person.

We must give some thought to the other fellow's problems, and in our turn must be willing to accept suggestions from the other fellow. An outside viewpoint sometimes corrects an opinion, faulty by reason of being formed from "too close a close-up."

We must recognize that the interest of this glorious state of ours always comes first.

We must realize that primarily we are dealing with human values.

We must BELIEVE in the California that has been, that is, and that is to be.

Therein is the code for the conduct of our duties.

Accept it as a challenge or receive it as a religion, as you wish.

Be that as it may be, it is the steel tape by which the usefulness of each and every one of us engaged in this work must and will be measured.

In a few days my term of office as Director of the Department will end. At this time, I

desire to thank my associates and co-workers in the department for the magnificent response that has been made to the ideals that we first set before ourselves.

No official could have received more and better cooperation than has been accorded me, both from those immediately associated with me in the great work of building California, and from the public as a whole.

This support has been most loyal, and that is in agreement with the only quality of loyalty that I believe any public official has the right to ask or expect, namely, a loyalty that recognizes that its first obligation lies to the people of the State of California rather than to the particular person who may be in administrative control for the moment. This is a continuing loyalty that takes no cognizance of changes in administration but always gives to the state the best in ability and the best in service that the individual possesses. It is this loyalty that I have desired, a loyalty that recognizes its first duty to the state, and this is the quality of loyalty that I have received.

I bespeak for the new administration and for my successor, the incoming director, the same degree of able and gracious support accorded me, and which has made my work, however heavy it might appear, not a burden, but an ever-continuing and increasing joy.

If we of the Department of Public Works have lived up to the ideals to which we set ourselves four years ago; if we have been able to keep faith with the people of California; if we have been of assistance in relieving the distress of the unemployed; if we have been a factor in building a better and more beautiful state—we can take pride in the fact that while we may be forgotten, yet the work that we have done will live on, adding to the comfort, increasing the prosperity, and ever enriching the lives of the people of the great commonwealth whose privilege it has been ours to serve.

DEPARTMENT GRIEVES AT

DEATH OF DEPUTY DIRECTOR

Corning De Saules, Deputy Director of the Department of Public Works since the reorganization of the department in 1927, died at his home in Sacramento on Tuesday, December 23d. In his death the state lost the services of a faithful, loyal, and able official.

3107 Men Now at Work Under State Highway Unemployment Relief Program

R EPORTS as of Saturday, December 20, 1930, show that the program for unemployment relief upon the state highway system is affording employment to 3107 men who otherwise would be without work.

On that day 1732 men were at work on relief maintenance crews working out from over 200 centers in California. These men are working upon a three-day-a-week basis and are paid \$4 per day. They provide their own board and lodging. The work assigned to them is that which lends itself to the use of a maximum of hand labor and a minimum of machinery.

These crews are organized in addition to the regular maintenance organization. Men given employment on the special relief crews are certified to by community relief agencies as bona fide residents of California and in great need of employment.

In order to afford relief to unemployed labor in the metropolitan areas of California five labor camps have been established and are now carrying their full quota of 250 men each. These camps are respectively located in Plumas County on the Feather River lateral; on the alternate Ridge Route and on the Arroyo Seco Highway in Los Angeles County; on the Yosemite lateral in Mariposa County and on the Carmel-San Simeon Highway in Monterey County. A special relief construction crew of 125 men is working on the latter highway south of Monterey.

The men employed in labor camps are selected by the state free employment agencies and are again selected on the basis of their great need for labor and ability to qualify as bona fide residents of California. They are paid \$3 a day and provided with board and lodging. The special construction crew working out of Monterey and Carmel provide their own board and lodging.

EDITORIALS IN STATE HIGHWAY RELIEF PROGRAM

(From the Gridley Globe)

We like Bert Meek's way of relieving the unemployed.

While Congress, the President, governors, etc., are telling what is going to be done and quarrel over appropriations that under their provisions and restrictions will not provide work for months, and even in some cases a year or two to come, Bert, without unnecessary talk, goes ahead providing more and more work for idle men on the state road system, over which he at present has jurisdiction.

Bert's efforts mean that a thousand or two families are already enjoying food and comfort and that Christmas will mean joy to them.

The other method already means that hundreds of thousands of families are in needless misery and that literally millions of children will have a joyless Christmas.

(From the San Luis Obispo Telegram)

While municipal officials, groups of business men, welfare agencies and similar organizations are holding meetings and talking about what to do for the unemployed, the State of California, through the Highway Commission, is going ahead, giving work to the workless.

California's highway department, under the leadership of Bert B. Meeks, Nipomo boy, and Director of Public Works, jumped into the breach immediately the unemployed crisis reached noticeable proportions, and began to use its organization and all its available funds for relief.

Starting out with plans for establishment of four labor camps in the state to give jobs to at least 1000 men, other plans to give work while the camps were being established, were launched.

Each division of the Commission was authorized to add to the number of men on its maintenance crews, so that in the division with headquarters in San Luis Obispo, 100 men will be on this work before the first of the year.

Still seeking to serve, the officials rushed to completion plans and specifications for contemplated work, advertising for bids at earlier dates than had been planned, so that work would be available during the winter months when, of course, the needs for food and fuel are greatest.

Here is state SERVICE OF THE HIGHEST KIND, social service that will have more wide reaching benefit to the state as a whole than any other thing that the commonwealth could do.

Only the highly organized efficiency of the highway department, coupled with its spirit of doing its best for the state, made possible the great aid that is being given so promptly in this time of need.

All California should be proud of the Highway Commission, and of the men who compose its personnel throughout the state, and grateful to it for the big thing it is doing.

Doctor: "Well, my dear, you certainly have acute appendicitis."

Patient: "Oh, doctor, don't flatter me so."

Next Ten Years in Highway Building

By C. H. PURCELL, State Highway Engineer

FOR THE past two years the State Division of Highways has been carrying on a study to determine the cost of bringing the present state highway system to a status of improvement to adequately and satisfactorily serve traffic. This study has now been completed and shows the estimated cost to improve the state highway system to adequate standard to be \$313,565,906.

Early in the study, several methods of preparing such an estimate presented themselves. An estimate of cost of immediately improving all roads to a standard required by present traffic would present a hypothetical amount which we know is not available. An estimate of cost of improving each route to some arbitrary standard to adequately serve traffic necessary to justify that standard would produce the amounts necessary for such arbitrary standards, but improvements would be carried over a variable period of time for each route and, therefore, would not present a workable basis for such a study. The method of computing these estimates finally decided upon was on the basis of providing adequate service for a definite period. It presents, as nearly as can be determined from data of present and predicted future volume and character of traffic, the amount necessary to make the highways satisfactory in location, type, width, and character for the traffic which will develop over a period of ten years: namely, from July 1, 1931, to June 30, 1941.

The estimated cost will not complete the state highway system. Completion of a highway is a relative term. It does make conservative allowance for growing traffic demands. It provides improvements adequate as measured by the traffic which may be conservatively predicted to develop within that period of time. This estimate of cost should be qualified, as future changes in conditions which can not at present be foreseen may alter probable construction costs.

Various factors influenced the selection of standard and type of road, and, consequently, the costs of providing the type of improvement which, while commensurate with the traffic requirements, will also give consistent and economical returns on the investment. These were: (1) The present facilities, their condition, salvage value, and deficiencies needing correction before an economic pro-



C. H. PURCELL

gram can be continued. (2) Present and future volume and character of traffic on each route or section thereof. (3) The type and width of pavement necessary to serve increased traffic. (4) The economic balance between cost of construction and cost of maintenance under expected traffic conditions. (5) The relative priority or importance of each route.

The volume and character of traffic using a highway is probably the best measure of the standard and character of construction required. Study of the traffic problem includes consideration of increased standards made necessary by increased legal speed limit; elimination of hazards due to alignment, grade, railroad crossings and important highway intersections; and increased strength of pavement made necessary by larger volume of heavy commercial vehicles moving at greater speed. Modern highway practice demands that increased costs require more care-

ful consideration of such factors as the value of reduced distance providing saving in operating cost and time, safety in design and in control by elimination of hazards, smoothness of pavement for comfort at higher speeds, beautification of roadside, landscape, and structures, and a regard for scenic and recreational features. Ultimate saving and preparation for future logical improvement is important. Failure to build for the future by visualizing its demands and incorporating the necessary features in each stage of the development will increase maintenance and reconstruction costs. The estimate of cost of bringing the present state highway system to an adequate standard was based on a policy developed from a study of such factors with the intent of providing economically and expeditiously the necessary improvement.

ESTIMATES OF AVAILABLE REVENUES

In connection with the preparation of the estimate of cost of bringing the present state highway system to an adequate standard within a ten-year period, estimates were also prepared of revenues which would become available for such action within the same period under the present statutory provisions.

Revenues for state highway construction, reconstruction, and maintenance, with the exception of federal aid funds contributed by the federal government, are secured by direct taxation of the users of the highways. There are four sources: (1) Motor vehicle registration fees. (2) Motor bus franchise fees. (3) The original 2-cent fuel tax effective in 1923. (4) The additional 1-cent fuel tax effective in 1927. One-half of the net income from the first three sources is apportioned to the 58 counties in California for road purposes, and one-half is apportioned to the state for state highway purposes. The entire net income from the fourth source (additional 1-cent fuel tax) is apportioned to the state.

In the estimated revenues available for state highway construction is included the amount of federal aid apportioned to California from appropriations voted by Congress. The estimated amount of this federal aid contribution is based on past appropriations and is included on the assumption that such congressional appropriations will continue. Federal aid is not a direct appropriation immediately available, but must be earned by the application of state funds to projects on the federal aid system. It is paid to the state only after work has been completed.

The estimate of total revenue available to the state for state highway purposes in the

ten-year period, July 1, 1931, to June 30, 1940, is \$422,015,334. This total revenue is for all purposes in connection with state highway construction, reconstruction, and maintenance.

In order to arrive at a figure of revenues available for actual construction and reconstruction, there must be deducted from this total amount the respective cost of administration, general maintenance, and funds set aside for joint highway district aid. The last named function is provided for by law to be not in excess of 10 per cent of secondary construction revenues. The total estimated cost of administration, general maintenance, and 10 per cent of secondary construction revenues for joint highway district contribution, is \$101,662,583.35. This amount subtracted from the total available revenue leaves a balance of \$320,352,750.65. This latter amount is the total revenue available for actual construction and reconstruction of state highways, including right of way and engineering expense.

RELATION OF EXPENDITURES TO REVENUES

The total cost of construction and reconstruction for a ten-year period to bring the present state highway system to an adequate standard for traffic developing during that period amounts to \$313,565,906. Probable revenues applicable to such construction and reconstruction during the same period total \$320,352,751. Comparison of these independently derived estimates indicates that, considering totals only and the state as an undivided unit, the state highway system could be brought in about ten years to a satisfactory status with respect to traffic demands.

Classification, however, of state roads in primary and secondary routes and statutory division of funds to state districts, constitutes a control which presents an entirely different picture. Construction revenues are divided first 75 per cent to primary and 25 per cent to secondary roads. Both reconstruction and the 75 per cent primary construction funds are divided between the north and south districts of the state on the basis of primary mileage. This division results in 54.7 per cent for the north section and 45.3 per cent for the south section. The secondary 25 per cent construction revenues are divided equally between the north and south sections of the state. Applying revenues so divided against the estimated costs so classified shows that reconstruction and construction of primary highways, both in the north and south sections, can be accomplished within the ten-year period. On secondary construction a deficit

(Continued on page 17.)

The "Braided" Crossing, Latest Phase In the Evolution of Express Highways

By COL. JOHN H. SKEGGS, District Engineer

THE first construction work of any kind undertaken by the California State Highway Department between Sausalito and San Rafael was in the year 1914, at which time a grading contract for some six miles of this highway was let.

At that time people had had no past experience with highways and were not educated to foresee the tremendous settlement and property development which would follow in the wake of highway construction, nor were they in a position to visualize the extreme growth of traffic in a short period of time upon the opening of these new roads.

For these reasons funds for highway construction, as voted by the people, were extremely limited and as a result the standards then set up, though entirely adequate to serve the needs of the times, have proven to be entirely inadequate for present day requirements. In right of way problems, in so far as possible, people forced the utilization of old county roads and poorly aligned streets through the settlements and towns. As a rule, the main streets only through the towns

were adequate to even be considered in routing the highway. Many settlements had only the one main street. As a result, business growth on those streets was accentuated, traffic demands being more or less of a local nature.

With the growth of business the parking problem came into being, and, with cars parked along the sides of these business streets the effective width of the roadway for travel was narrowed, causing congestion. This condition in the towns was emphasized by rapidly increasing traffic upon cross streets.

Another heavy factor in increasing traffic demands was the development of the automobile. The first models, with the exception of a few of the higher priced cars, could scarcely attain a speed exceeding 40 miles per hour. Due to this fact, long trips causing through traffic were rare in comparison to those of today.

TRUNK HIGHWAYS AND CITY STREETS

With the development of fast cars at a moderate price came the desire of people to



Braided crossing at Manzanita Station, showing the south end of the bridge over Richardson Bay. The picture is taken looking northerly

settle farther out from the business centers, and long trips at high speed are now an everyday occurrence. Consequently, through traffic, as far as highways are concerned, has entirely overshadowed the traffic of local demands.

With the development of through traffic came a cry from business men in some communities that trunk highways are not a benefit to them, but a damaging influence to their business; due, first, to the parking problems involved, and, secondly, to the present desire of people to keep out of any sort of traffic jams.

The people now are educated to the extreme economic influence of through roads and highways; and, with the passage of the gasoline tax, a sufficient amount of money has become available to rebuild these highways to conform to the requirements of today.

SAUSALITO-SAN RAFAEL DEVELOPMENT

This typical condition of development and corresponding reaction was particularly emphasized on that portion of Route 1 known as the Redwood Highway, between Sausalito and San Rafael, and has resulted in an entire relocation of the original highway, which passed through the towns of Corte Madera, Larkspur, Kentfield, Ross and San Anselmo to San Rafael.

That the new route is much more direct is evidenced by a saving in distance of about

four miles between the two towns, this being about 30 per cent of the original distance. All towns and settlements have been avoided, and yet are easily available to the new road. The width of the highway has been increased and provision made for still further widening, as traffic demands it. The number of curves has been reduced over 90 per cent and have been changed from short radius, oftentimes reversing turns, to long sweeping curves, heavily superelevated to conform to high speed requirements. Railroad grade crossings have all been eliminated. In short, the highway has been made into an express trunk line, functioning like a huge filling system in taking and depositing each ear at its proper destination, with an absolute minimum of delay and a maximum of safety.

THE THREE SECTIONS

The first section of this major express highway, three-quarters of a mile in length and 40 feet in width, from San Rafael to California Park, which also serves Point San Quentin Ferry to Richmond, was opened to traffic in 1929. The second section, from California Park to Alto, a distance of 4.4 miles, was opened to the public, paved 30 feet in width, in August of the present year. The third section of this highway, from Alto to Waldo, is to be let in two contracts, a combined length of two and one-half miles. Bids were taken on October 19th for grading and surfacing two miles, under the supervision of District



A three-deck structure, showing county road beneath and state highway above railroad

IV, Division of Highways; and bids for a bridge one-half mile in length over Richardson Bay and the Northwestern Pacific Railroad tracks being called for on October 26th, to be constructed under the direction of the Bridge Department, Division of Highways. This section involves but one curve of 900-foot radius, this occurring on the south end of the bridge over the bay, which has an effective roadway width of 44 feet. Between Sausalito and Manzanita, the south end of the bridge, the new road is to be paved 40 feet in width. North of the bridge it will be paved to a 30-foot width. The time limit set for completion upon both the bridge and road contracts between Alto and Waldo is 175 days, which means that this road should be opened to the public about July, 1931.

THE ROAD HOG MENACE

The road hog, who is almost altogether responsible for traffic accidents, might be likened to the small boy who was informed by his mother that if he ate another piece of cake he would burst, and received a prompt answer to please give him the cake and then get out of the way. The road hog, though



Highway approaching the braided crossing

warned by safety societies and much publicity regarding the consequences, asks us to give him the road and then get out of the way. He, however, not only endangers his own life but the lives of all with whom he comes in contact. At sixty miles per hour each, two cars from opposite directions approach each other at the rate of 172 feet per second. Such speeds are not now uncommon for short stretches, and the split second human reaction necessary to avert an accident when some road hog takes an undue advantage means the ultimate in safety precautions must be provided by the highway engineer.

Many safety measures have been used in an effort to reduce traffic accidents, among them being: stop and go signals, boulevard

stops, flashing red lights, red reflector signals, etc., warning the motorist of cross roads, intersections, sharp curves, etc. White painted traffic stripes, guard rail and guide posts, particularly in those sections of the country where heavy fogs prevail, have added much to the safety of our highways.

Later developments have been of more far-reaching importance, due to their incorporation in the basic engineering design, such as: the elimination of blind intersections, the construction of long, vertical curves and easy alignment for the sole purpose of increasing the sight distance along the highway, and the elimination of railroad grade crossings. The latest development in making our highways as nearly fool-proof as is possible is in construction of the more important highway crossings in such a way as to keep all traffic entering or leaving the highway moving in the same direction.

In the fight for reducing traffic hazard to a minimum, three major structures were built on the section between San Rafael and Alto: a triple overhead structure crossing the Greenbrae and San Quentin branches of the Northwestern Pacific Railroad and a county road at California Park; a new wide bridge over Corte Madera Creek at Greenbrae; and an overhead crossing at the Northwestern Pacific Greenbrae branch line at Detour. Two wide sweeping Ys have been provided at the California Park intersection with the Point San Quentin State Highway, and four such Y connections at the Alto-Tiburon State Highway crossing.

THE "BRAIDED" CROSSING

For the section of highway between Alto and Waldo there has been designed what might be called a "braided" crossing. Fully 80 per cent of the northbound traffic from Sausalito is expected to continue upon the main highway onto the bridge over the railroad tracks and Richardson Bay to San Rafael and San Anselmo, or diverting by connecting roads to Belvedere, Tiburon, Larkspur, Corte Madera, Kentfield, Ross and San Quentin. The other 15 to 20 per cent might be expected to swing off to the right upon a roadway passing under the bridge structure and connecting beyond and on the left to the present highway, which is later to be taken over by Marin County. Similarly, southbound traffic from Mill Valley and its adjacent territory, using the present road, will swerve to the right just before reaching the new highway junction to drive onto the new road a few hundred yards farther south.

(Continued on page 20.)

Conclusions on S. F. Bay Bridge Project

Announced by Hoover-Young Commission

COPIES of the report of the Hoover-Young San Francisco Bay Bridge Commission, with the recommendation of that body, have been released to the public through the publication of the Commission's report. This report which is addressed to President Hoover and Governor C. C. Young comprises a most complete and comprehensive analysis of the San Francisco Bay project.

Conclusions of the Commission are as follows:

(a) To meet the present and future needs of the several communities a crossing for traffic between San Francisco and the East Bay cities is necessary.

(b) Consistent with meeting the traffic needs and engineering requirements the type and location of a bay crossing should be such that it will not unreasonably obstruct future navigation nor cause serious interference with or constitute a serious menace to the operations of the Navy in time of war.

(c) Because of the limitations, cost of construction and operation a vehicular tunnel under the bay is inadvisable.

(d) As indicated by the rock explorations the only location upon which to base a high level bridge is on a line from Rincon Hill to Goat Island.

(e) A bridge on the location designated as Location No. 4, from Rincon Hill via Goat Island thence parallel to the Key Route mole, is practicable from an engineering standpoint. It is economically feasible under a proper fiscal plan and will adequately serve the needs of transbay traffic.

(f) The bridge should conform to the following specifications:

(g) The bridge shall provide at least six lanes for vehicular traffic and in addition five lanes for inter-urban and heavy automobile truck traffic.

(h) The bridge between San Francisco and Goat Island shall consist of not more than four main spans, the westerly one of which shall have a horizontal clearance of not less than 1750 feet between fenders.

(i) The vertical clearance of the two center spans shall be not less than 214 feet above M.H.H.W. at the center of the spans, and this height shall be maintained for approximately 500 feet on either side of the center of the span, and the minimum vertical clearance at the San Francisco pier head line shall be 180 feet above M.H.H.W.

(j) The main channel span in that portion of the bridge between Goat Island and the east shore shall have a minimum vertical clearance of 180 feet above M.H.H.W. and a minimum horizontal clearance of 600 feet between fenders. Consideration should be given in the final plans to a minimum clearance of 700 feet between fenders.

(k) The final design should be such that it will conform with the scenic beauty of San Francisco Bay.

(l) The details of construction of the bridge structure is the function of the State of California working through the California Toll Bridge Authority.

Consideration of traffic distribution on both sides of the bay is of prime importance and should be worked out in cooperation with the authorities of the municipalities in interest.

(m) A right of way across Goat Island must be obtained from the Navy Department and be approved by Congress.

Under the provisions of the federal law after legislative authorization by the State of California, the plans of the bridge must receive the approval of the Chief of Engineers, War Department, and of the Secretary of War before construction is begun.

The legislative authority of the state for the construction of the bridge is vested in the California Toll Bridge Authority. In order that the bridge may be constructed it is necessary that the Bridge Authority authorize and direct its construction.

The Commission having given due consideration to national defense and the needs of commercial navigation and in the light of all facts recommends the approval of a bridge upon Location No. 4 provided the clearances specified are adhered to.

Members of the Commission are:

Mark L. Regna, Chairman;

George T. Cameron, Vice Chairman;

Rear Admiral Luther E. Gregory, C.E.C., U.S.N.
Ret'd;

Rear Admiral W. H. Standley, U.S.N.;

Brigadier General G. B. Pillsbury, U.S.A.;

Lieutenant Colonel E. L. Daley, U.S.A.;

Senator Arthur H. Breed.

Charles D. Marx.

C. H. Purcell.

ESTIMATED COSTS

The estimated cost of the Rincon Hill-Goat Island location structure is \$72,000,000.

TRAFFIC FINDINGS

Relative to probable traffic that the bridge will serve, the Commission finds as follows:

The present facilities for crossing the bay between San Francisco and the East Bay district consist of automobile, passenger and freight ferries. In 1929 the auto ferries carried a total of 4,490,513 cars and 10,174,028 passengers, showing an annual increase of 8.2 per cent. Passenger ferries carried a total of 35,923,855 passengers, a decrease of slightly less than 3 per cent under 1928. The origin and destination of auto traffic in San Francisco is at the Civic Center. In Oakland it is at the intersection of Moss and Oakland avenues.

The origin and destination of commuter traffic in San Francisco is near Fifth and O'Farrell streets. In Oakland it is near Moss and Oakland avenues.

(Continued on page 20)

Director Meek Sends His Resignation to Gov. C. C. Young

B. B. Meek, director of the Department of Public Works, forwarded his resignation to Gov. C. C. Young on November 25, 1930, to become effective on or before January 5, 1931.

In his letter of resignation, Mr. Meek refers to the fact that when he first accepted the appointment from Governor Young, it was understood that he would serve only until the then newly created Department of Public Works was organized. The letter states that he continued to hold office despite a very considerable sacrifice to his private business, because of the absorbing interest that he found in the work.

Mr. Meek further writes that he has sent word to Governor-elect Rolph that in his capacity as a private citizen he will do everything in his power to aid and assist his successor in carrying on the work of the department. Because of the place that highway building has in the upbuilding of California, and its present emergency importance in providing employment, Director Meek voices the hope that there will be no interruption in the big highway program now underway. He also emphasizes the importance of aggressively pushing to completion the San Francisco Bay bridge project; of translating into a definite program of action the studies and investigations into the water resources of California and of further developing the ten-year building program for state institutions prepared by the Division of Architecture.

The letter expresses appreciation for the aid given by Governor Young in the administration of the affairs of the Department of Public Works. On this point Mr. Meek writes as follows:

If, during the last three and a half years, the department has been able to accomplish what is was designed to accomplish, it has been because of the confidence you have constantly given me. You have never in a single instance asked this department to discharge a political debt. This has made possible the building of both a very human and a very efficient organization.

As I have frequently stated it is my desire to retire to private life the day you become a private citizen. And, in spite of the intense interest, I have in the work of the department, still the opportunity to devote time to my now long neglected personal affairs is most welcome, and I might add, most necessary. At this time I desire again to thank you both for the privilege you have given me to engage in this splendid work, and for the confidence you have had in me, and once more to express my heartfelt appreciation for the wonderful support you have given me.

GRADE CROSSINGS FAST DISAPPEARING FROM ROADS



Grade separations at Glendora

The Division of Highways has, during the past year, carried on an active program of grade separation work on the heavily traveled road connecting Los Angeles and San Bernardino. A subway which completely eliminates grade crossing over the Santa Fe tracks has been constructed at Glendora. About two miles east of Upland existing subway under the Pacific Electric tracks has been remodeled to double the width of highway. At Malaga, approximately eight miles west of San Bernardino, a new wide subway which completely eliminates the highway crossing over the Pacific Electric Railway tracks is nearing completion. In each case the railroad companies contributed part of the cost of the structures.

FRONT COVER PICTURE

The front cover picture on this issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS shows B. B. Meek, surrounded by views of some of the activities over which he has had charge during his administration as Director of the Department of Public Works.

"Brederin, we'se got to do sumpin' to remedy de status quo."

"Parson, what am de 'status quo'?"

"Dat, my brudder, is de Latin for de mess we'se in."

Ten-year Building Construction Program for State Institutions

By GEO. B. McDOUGALL, State Architect

IN THESE DAYS when the wisdom and necessity of regional planning, city planning and zoning of cities have come to be generally recognized, the State of California is operating so far as the development of its institutions is concerned on the basis of a ten-year building construction program.

Up until 1925 no consideration was given to the suggestion more or less frequently made

that building development programs should be worked out for the State's institutions.

In that year the financial set up for the Division of Architecture was altered so as to make it possible to start the development of plot plans of the 26 major institutions then existing. Prior to that time the determination as to what building construction

development should be provided for at any given meeting of the Legislature was based almost wholly on isolated consideration of a particular proposed structure and its location, rather than upon a comprehensive development scheme taking into account the certain ultimate growth for each institution.

Early in his administration Governor Young, in order that he might have information needed for formulating an orderly program of building construction, requested Mr. B. B. Meek, Director of Public Works, to have made a tentative building construction program to cover a period of ten years. The director delegated this task to the Division of

Architecture. This division, with the Division of School House Planning of the State Department of Education, worked out a program which with modifications was approved and adopted by the Governor and submitted by him to the Legislature of 1929, with his budget of proposed expenditures and estimated revenues of the state.

FACTORS IN PROGRAM

The following principal factors constituted the basis of this program:

First: The ultimate capacity of each institution in patients, students or inmates.

Second: Present and future needs during succeeding bienniums for patient, student or inmate accommodations so as to bring the several institutions up to their proper ultimate capacities by the end of ten years or sooner.

Third: Probable amounts of money that can reasonably be expected to be made available for expenditure for building projects during succeeding bienniums for ten years.

Fourth: Available building sites on the various properties taking into account areas now owned by the state and areas that can be expected to be added.

CAPACITY OF INSTITUTIONS

As to the first factor, the ultimate capacity, the various state departments and institution heads, after extended careful consideration, made this determination.

ESTIMATES OF INSTITUTIONAL GROWTH

Second, figures of probable growth during the ten-year period were arrived at on the basis of the average growth during the preceding twenty years. The figures so obtained were in numerous cases checked against estimates arrived at by discussions of probable growth with the institution heads, and the two sets of figures were found to check very closely.

COST ESTIMATES

Third, it was conservatively figured that provision can probably be made for expenditure for building construction at the institutions exclusive of the state university of about



GEO. B. McDOUGALL



THE VETERANS' HOME AT YOUNTVILLE

\$5,000,000 for each biennium, or a total of \$25,000,000 during the ten-year period.

BUILDING SITES

Fourth, as to available building sites, the plot plans already mentioned which are available for 26 different institutions, show all existing buildings and the locations of all additional buildings required during successive bienniums to house the portion of estimated numerical growth during ten years which it is thought should be assigned to the several institutions. The plot plans constitute probably the most important single element in bringing about the total result in connection with the ten-year building program.

The preparation of these plans has required several years time. The Division of Architecture is retaining the originals and keeping them up to date.

OLD FAULTS CORRECTED

Following are some of the defects in earlier institution development which are being corrected by the ten-year program:

First: Provision of proper living quarters for employees in institutions where required was almost entirely neglected except in the most haphazard way. One result was increasingly serious difficulty in administration, and another now being encountered is the necessity for successive expenditures for this need which are out of proportion to expenditures required for inmate housing; a portion of this financial burden for employees' quarters should have been borne in the past.

Second: The replacement of temporary structures was given practically no consideration, resulting in too long continued use of insufficient, unsanitary and fire-inviting structures. These replacements are now requiring disproportionately large expenditures from which no increased inmate capacity is resulting.

Third: Absence of foresight has resulted in serious overcrowding in many of the institutions so that it is not possible to operate with full efficiency nor to accept as patients many who should be admitted.

Fourth: Sites for particular buildings have in numerous cases been unwisely selected because without reference to the effect of such selections on necessary future development.

A STRIKING EXAMPLE

One of the most marked examples of the effectiveness of long-time planning for the development of an existing institution based on plot plan study is furnished by the Veterans' Home at Yountville. This institution

was originally built some fifty or sixty years ago to meet conditions then existing. The old buildings in many cases contain basement, two stories and attic and are of wood frame construction. Various wooden structures have been added to the institution from time to time during the succeeding years, as isolated demands appeared to require.

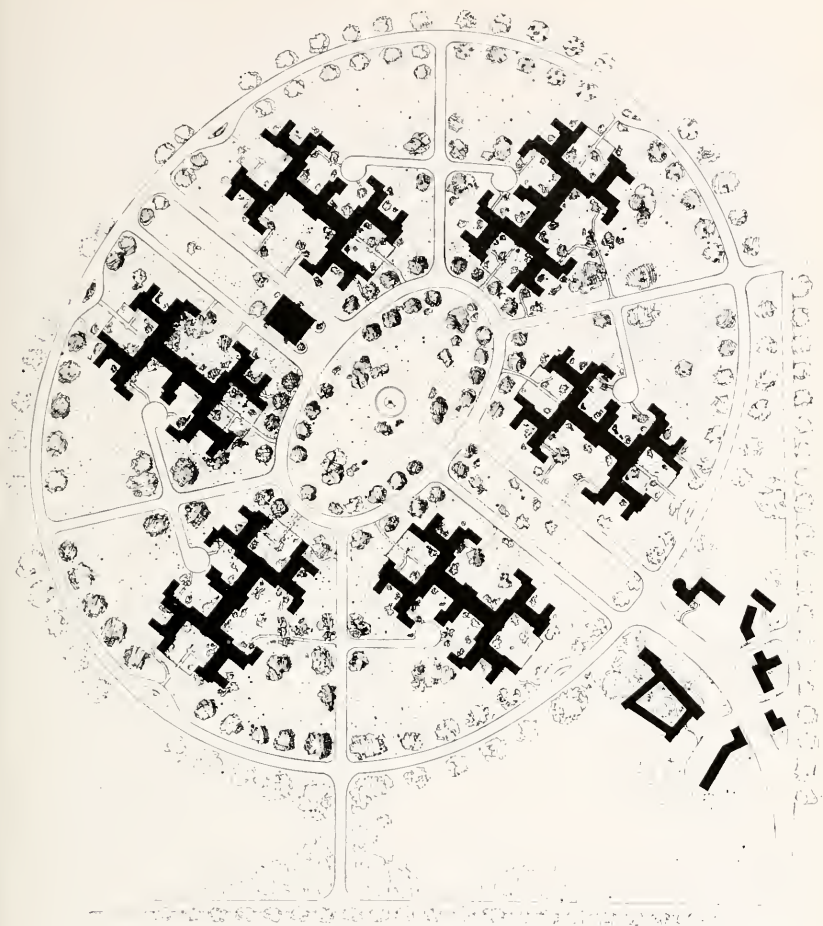
After repeated requests provision was at length made to permit the Division of Architecture to make a survey of the entire institution on the basis of which the Division, with the full cooperation of the institution, has developed an approved scheme for the gradual replacement during a ten-year period of the old insufficient, unsanitary, wooden fire-trap buildings with modern reinforced concrete structures carefully designed and planned with reference to the present and future functioning of the home. The most urgent need was barracks buildings for the men. The process of reconstruction therefore started with an appropriation made in 1927 which covered one new barracks building; a second appropriation in 1929 covered two additional barracks buildings which are now completed, and a fourth barracks building is suggested in the proposed 1931 budget on which action is soon to be taken. Since each barracks building provides for 200 beds, the one last finished having an additional capacity of 30 beds, provision has already been made under the ten-year program to transfer 630 men from the old buildings to new modern fire-resisting structures.

SOME OF THE PROBLEMS

This project affecting an old institution was complicated by the necessity of so planning and timing the construction of the new structures as not to interfere with the occupancy of the old for as long as required for continuing operation. The program as a whole is being carried out with entire smoothness and with very little inconvenience to the institution.

The character of the site as to its shape, foliage and surroundings, the harmonious blending with it of architectural forms, materials and colors, and the dovetailing of the designs and plans of the structures with the function and spirit of the institutions, all are being combined and interwoven with one another so that the ultimate result will be one of the most picturesque, beautiful and practically effective institutions of its kind in the country.

The case of the Veterans' Home has been dealt with at some length as being typical and illustrative of the new life which, by the



Ultimate development of Agnews State Hospital

application of the art of architecture and as a result of the operation of the ten-year program, is being created for and injected into all of the older institutions of the state.

The state has within the last two years authorized entirely new institutions for the following: the San Diego State Teachers College; the California Institution for Women; a new state hospital for insane in southern California; and a new state prison for first offenders in southern California.

The principles underlying the ten-year

building construction program are being applied in all these cases.

In each case the Division of Architecture has been and is being asked to advise the boards or commissions responsible as to the practicability and desirability of proposed sites. The cases mentioned are the first ones in the history of the Division in which this has been done.

As soon as sites were selected in the cases of the college at San Diego and of the Institution for Women near Tehachapi, surveys

(Continued on page 26.)

Biennial Budget Is Adopted by State Highway Commission

A BUDGET recommending a state highway expenditure of \$63,322,500 for all state highway purposes and from all state highway funds for the ensuing two fiscal years was formally voted Thursday, December 18th, by the California Highway Commission. The budget was presented to the Commission with the recommendation of B. B. Meek, Director of Public Works, and C. H. Purcell, State Highway Engineer.

The budget as adopted has been transmitted to Governor C. C. Young and the State Department of Finance. Copies have also been sent to Governor-elect James Rolph, Jr., and to Colonel Walter Garrison, whom Governor-elect Rolph has selected as his Director of the Department of Public Works.

In view of the fact that final decision upon the project items included in the budget will rest with Governor-elect Rolph, Colonel Garrison, the incoming highway commission, and the legislature, it was the decision of the present commission that publicity as to the detailed projects recommended for inclusion in the 1931-1933 state highway program should come from Governor-elect Rolph rather than from the present administration.

Awards Offered for Statewide Safety Campaign Slogans

WITH the object of impressing thoughts of safety upon motorists and the general public, the California Committee on Public Safety yesterday announced that cash awards will be given for the best slogans submitted in a statewide contest. The winning phrases will be used to provide emphasis for the program of educational and enforcement campaigns to be conducted each month by the Committee throughout 1931.

There will be twelve safety subjects, one for each month. For the best set of slogans submitted for the entire series of subjects a cash award of \$100 will be given. The second best set will receive \$50, and the next ten sets will be given \$10 each. The contest will close December 15. Contestants may send their slogans to the Public Safety Department of

SOME ACCIDENT THIS; JUST WHAT HAPPENED?

The following is a verbatim copy of a letter received by the Division of Motor Vehicles:

Mr. Okamoto, my good friend, is going to Japan, so I want to see him for shaking hand with he and Mrs. Okamoto. This morning, 5 AM, got up from the bed, six started from my home, Hawthorne, came to Gardena, thought to buy gasoline more, and did repair for safety, did examined generata, choker and coil or other place, was very good condition, no trouble, after three minutes waited 3 gasoline men, 1 gasoline lady, open and gave gasoline. Then started again and come to Mr. Okamoto's house. After Mr. and Mrs. Okamoto met with, he was busy to other place first. Then after ten minutes, came out to the front of his house that is the Wilmington. Saw his car John Welch's car too was far about 405. Telephone electric post, it is not danger. Right-way, broken my car right front car wheel all broken crooked 1 or 2 time. Crooked steel piece or broken when all over the street I went. His car too much speed and too fast. Because I never such Big trouble before. His the most seed is not, it is the big accident I believe. It is all the same dream, I think. My insurance yato tell about all this, as it is better one.

the California State Automobile Association, 150 Van Ness Avenue, San Francisco.

While no limit has been placed on the number of words in a slogan, the Committee points out that the shortest are usually the most effective, such as, "Taking a chance may take a life." The list of subjects for the monthly campaigns on which the contestants may base their slogans is as follows:

January—Failure to yield the right of way at intersections.

February—Unlawfully passing standing street cars.

March—Failure to give required arm signals: failure to keep in proper lane when turning; cutting-in.

April—Excessive speed at intersections where view is obstructed.

May—Disobeying boulevard stop regulations and Stop and Go signals.

June—Endangering safety of children at play—speed or inattention.

July—Railway stop signals (wig-wags).

August—Failure to keep to the right—hogging the road.

September—Unlawful speed in school zones.

October—Inadequate brakes.

November—Glaring and illegal headlights.

December—Disobeying regulations for pedestrian protection.

Each contestant must send in original slogans, and the committee reserves the right to use any or all of the winning ones. Contestants must use a single sheet of paper and write on one side only, giving their name and address in the upper left-hand corner. The months to which the slogans are applicable must be specified.

New Bridge to Span San Luis Rey



The New San Luis Rey Bridge

REPLACING a narrow pile trestle structure which was hastily thrown across the San Luis Rey River after the disastrous flood of 1916, the Division of Highways is building a new high level, wide, modern bridge on improved alignment.

The new structure, which was designed by Bridge Engineer Chas. E. Andrew of the Division of Highways, is 927 feet long. Including sidewalks, the width is 50 feet. The main spans are each 265 feet in length. The

central piers of concrete which extend deep below the stream bed are founded on long timber piles.

Before designing the bridge, extensive explorations were made which revealed that sand and silt had filled the scoured channel of the river bed to a depth of about 175 feet.

Gutleben Brothers of Oakland, contractors, are building the structure at a contract price of \$281,542. The construction work is being supervised by Resident Engineer A. S. Kennedy.

Seek to Establish Radio Communication for Highway Patrol

Research experiments are being made by the California Highway Patrol to determine the possibility of establishing radio telephonic connection between highway patrolmen working on their beats and their district and central offices, it was announced here today.

A special type of radio telephone light enough to be carried on a motorcycle but powerful enough to have a range of several hundred miles is being considered. If successful this will enable the district inspector or squad captain to get in immediate communication with his men in case of accident or any other reason necessitating a quick move of officers from one place to another.

The preliminary plan of experiment involves the establishment of a 200-watt transmitter at the headquarters of the highway traffic school at Mather Field, near Sacramento.

Four cars equipped with receiving sets will be sent to different parts of the state to pick up the

messages sent out from the transmitter. One of these will operate in the extreme northern counties, another in the southern counties, another along the coast and a fourth in the interior valley.

These cars will make daily observations to determine where the so-called "dead spots" are located.

Information secured by the patrol indicates radio telephones are being used to good advantage by police patrols in a number of American cities, a notable success having been attained with them in Detroit.

Perfect communication, however, has thus far been possible where the distance between transmitters and receivers is relatively small.

The problem of the California patrol is to work out a system by which the officer may communicate with his superiors and receive their orders when at a considerable distance from his base.

KENTUCKY—National Representative Thatcher of Louisville advocates a park-to-park highway system in the East, similar to that linking western parks. Plans include linking the three largest national parks of the East—Mammoth Cave, the Great Smoky Mountain, and the Shenandoah National Park.

"De choir will now sing. 'I'm Glad Salvation Is Free,' while Deacon Jones passes de hat. De congregation will please 'member dat, while salvation am free, we has to pay de choir for singin' about it. All will contribute accordin' to his means, an' not for his meanness."

Teaching Californians to Drive

By FRED P. WILLIAMS, Head of the Bureau of Drivers Licenses

THE driver's license, properly issued and properly controlled, can and should be a most potent factor in the reduction of motor vehicle accidents on the highways.

No other factor in the control of the authorities offers such possibilities for weeding out the incompetent, for keeping reckless within bounds and for actually educating the person who wants to know something about the subject in the common, everyday rules of safety.

Although it is far from perfect, the legislature two years ago gave California a fair system of control of licenses. Outstanding features of the system are:

1. Provision for the examination of all new drivers, such examination to include inquiry into the applicant's physical and mental conditions and ability to drive.

2. Provision for the renewal of all outstanding licenses every two years with power for the state to demand an examination if deemed necessary.

3. Authority for the revocation or suspension of driver's licenses for cause.

When the new law became effective in the summer of 1929 we at once undertook the renewal of approximately 1,350,000 drivers' licenses issued prior to January 1, 1927. This task was accomplished in a period of three months.

Obviously, it was impossible to give this number of persons an extended examination in so short a time with the imperfect machinery that we had at that time at our disposal. The work was therefore confined, for the most part, to stressing the educational features and to weeding out those found to be actually unfit.

We were able to note some surprising results in the public reaction even in this short time. Almost immediately we noted marked improvement in the manner in which arm signals were given. We noted also that drivers paid more attention to sirens on emergency vehicles than before and apparently were more careful about keeping to the right and obeying traffic signs.

This, we believe, did not come from any fear that had been instilled into the minds of the drivers by the examinations but merely from the fact that the driving public had been informing itself concerning the law.

Our records show there are now 2,731,490 persons in California licensed to drive, inclusive of the 157,490 who operate under chauffeurs' licenses.

We are now issuing new licenses at the rate of about 31,000 every month. Examinations are given at the home office at Sacramento, at the six branch offices of the Division of Motor Vehicles, at several smaller branches, and at the county offices of all squads of the California Highway Patrol. In addition, examinations are given by some 109 branch offices of the automobile clubs and by numerous police departments and sheriffs' offices.

Under our law we must give an examination on every original application for a California license. This examination is three-fold, including an inquiry as to the applicant's knowledge of the rules of the road as set up in the vehicle act, a test of his hearing and eyesight and ability to read and understand highway signs, and an actual examination of the applicant's ability to operate a motor vehicle under the supervision of the examining officer.

The records of our own offices show that about 20 per cent fail to pass the initial examination. However, the percentage actually refused licenses is very small as it is our policy to be liberal and grant the applicant more time to study the regulations and to learn to drive. A second or third trial usually enables the applicant to pass successfully.

Those finally eliminated are usually found to be suffering from some physical or mental defect making it absolutely unsafe to permit them to drive.

We do not refuse a license because of a physical defect unless we are convinced such defect interferes with safe operation. In other words we have no objection to granting a one-armed or one-legged man a license if he can show us he is able to drive safely.

Our examinations frequently uncover minor defects which may be easily remedied to the lasting benefit of the applicant. This is notably true in our examination of the eyes of young applicants.

We have received practically no complaints that our examinations are too difficult; on the contrary many have complained that they are too easy.

Great tact is required on the part of our

examiners as applicants are frequently inclined to be nervous upon their first appearance. Careful and courteous treatment generally puts the applicant at his ease.

The examination of prospective drivers is a wide subject and one worthy of deep study on the part of our legislators. Throughout the country there is a growing tendency to tighten the regulations and to require more and more from the driver. Twelve states have adopted rigid systems for regulating drivers' licenses and many others are considering it.

The power given us to revoke licenses for cause is already bearing fruit in our war against the drunken driver. From January 1st to November 1st of this year 750 of the 1333 licenses revoked were for this cause.

Another innovation is the checking up of all persons involved in three or more accidents during any one year. When we find such cases we start an immediate investigation to determine if the driver is reckless or physically incompetent. Proceedings to revoke the licenses are started if justified by the facts.

NEXT TEN YEARS IN HIGHWAY BUILDING

(Continued from page 4.)

of over \$38,000,000 is encountered in the north section of the state; whereas, the secondary roads in the south section can be brought to an adequate standard within the ten-year period.

During the next ten years, moderate changes in the expected volume, character, and speed of traffic would not alter the type and, therefore, the costs given in the estimates. An increase above the probable estimated revenues that would accumulate a sum sufficient to bring about an adequate status of highways sooner than herein set forth, would have to be a material regular increase, which is improbable. A decrease in the estimated revenues would create a deficit, while the demand for improvement will still be as insistent and necessary as is now predicted. Such a deficit would protract indefinitely the period of attaining the satisfactory status. Such a contingency should not induce an over-optimistic attitude nor permit withdrawal from present anticipated revenues for other purposes.

The prospect of bringing the state highway system to an adequate standard does not infer either than the entire system will be completed during the stated period, or that in the immediate years revenues are sufficient to

Highway Patrol Is Commended for Courtesy and Help

The following letter was addressed to Roy H. Youngblood, Assistant Superintendent of the California Highway Patrol by John J. Crowley, Chancellor of the Diocese of Monterey-Fresno:

Press of other business has prevented me from acknowledging ere now your extreme kindness and courtesy in furnishing an escort for Cardinal Hayes during his stay in central California. The escort was one of the features of the visit of his Eminence that pleased him highly, and which also relieved the minds of Bishop MacGinley and all of us who felt responsible for his safety while in our environs.

Cardinal Hayes personally assured your officers of his appreciation, and I want to add here, on behalf of Bishop MacGinley and all of us who were in the party that the cooperation and upstanding gentlemanly conduct of officers Sloat and Farr, if it can be taken as an example of the efficiency of the reorganized State Highway Patrol, bespeaks an organization that is second to none. We were proud of them.

Again thanking you for this signal service, and with the compliments of the Right Reverend Bishop, I am,

Very sincerely yours,

JOHN J. CROWLEY,
Chancellor.

Supplied Lost Power.

The following letter was received from Ruel Baker, assistant cashier of a San Francisco bank:

I wish to thank the California Highway Patrol for the courteous assistance given me by Herbert Bolton and Thos. Taylor, state traffic officers, on the night of November 26th on the state highway between North Sacramento and Roseville.

These gentlemen very graciously pushed my car back to a garage when engine trouble developed. They refused to accept a tip and I wish to express my sincere appreciation of their kindness.

What do you do?

I keep house, scrub, scour, bake, wash dishes, cook, do the laundry, iron, sew.

And the census taker listed her: Housewife—no occupation.—*Louisville Courier-Journal*.

take full advantage of making improvements on the basis of strict economies of service to cost of service. Many roads must receive stage construction, reconstruction, and heavy maintenance, while the increase in annual revenues accumulates the necessary funds for permanent type. Some roads would still have a low type surface, although they will be of a type temporarily equal to the traffic requirements.

Highway Policy Pronouncement Made by Association of State Highway Officials

RESOLUTIONS adopted by the American Association of State Highway Officials in annual convention at Pittsburgh, Pennsylvania, in November, comes a number of matters of interest in highway circles the nation over. Among the matters on which the association expressed itself were the following:

Recommendations for ways and means of increasing highway construction as an aid to unemployment;

Methods of securing a larger measure of roadside beauty;

Recommendations relating to financing of highways of secondary importance;

Greater uniformity in gasoline taxes and motor license fees;

Expression of views on toll bridge construction;

Recommendation that funds be provided for road construction in the public domain, and that the limitation of federal aid to \$15,000 a mile be removed;

Recommendation for the coordination of the highway and airway service.

ROAD BUILDING TO AID UNEMPLOYMENT

An increased federal program for road building to aid unemployment was advocated and specific recommendations asked:

1. That prompt measures should be taken to stimulate and enlarge the present cooperative state and highway building program to the fullest extent;

2. That a substantial emergency federal appropriation be set up and be expended under the existing federal highway legislation, and only through such legislation; that in addition thereto a substantial emergency fund be set up by the federal government to be advanced to the several states, to be used by such states to match federal funds, said advances to be later repaid from state revenues or from future installments of the federal highway appropriation.

3. That the amendments necessary to expedite the placing under construction of federal highway funds be made and that the benefits of the emergency appropriation and this

recommended legislation be limited to those states which shall in no way decrease or remove from the control of the State Highway Department the present incomes or adversely change the sources of revenue.

4. That a substantial emergency federal appropriation be made to be used to expedite the completion of the forest highway system to be expended by established agencies.

FAVOR ROADSIDE BEAUTIFICATION

Roadside beautification and its varied activities are advocated as reducing highway maintenance costs by checking erosion, preventing slides and controlling drifting snow; reducing accidents; increasing adjacent property values; promoting civic pride; equalizing temperatures; opening and revealing natural beauty; advertising the state and providing a healthful recreation and enjoyment for all highway users.

Specific measures to secure more beautiful highways are outlined as follows:

1. Adequate width of highway right-of-way be acquired at the earliest time to provide for future widening and a detailed plan of beautification.

2. Conservation of natural growth be recognized of first importance and that unnecessary destruction of roadside plants be prohibited.

3. The absolute control of the right-of-way be vested in the Department of Highways.

4. Responsibility for roadside beautification be vested in a competent person to carry out the work of the department and to encourage individuals and organizations to assist in beautifying town entrances and the roadsides in their localities.

FINANCING IMPROVEMENTS FOR SECONDARY ROADS

As there is considerable agitation for improvement of secondary roads, in some cases classed as farm-to-market roads, with a resultant demand for diversion of state funds now available for state systems in the several states, the association expressed itself as follows:

1. That until such time as the primary

routes have reached an advanced stage of improvement federal funds, exclusively, and the major portion of state funds should be used entirely to expedite work on this system;

2. That when the present designated federal aid systems have been improved to an advanced degree advantage should then be taken of the provision of the Federal Highway Act to increase the mileage of federal aid system, upon which federal aid funds may be used by applying said federal money to what might now be considered secondary roads;

3. That when the primary routes have reached a reasonably advanced stage of improvement, in keeping with traffic demands, then the states should recognize their responsibility to traffic on the secondary system of highways or county trunk highways, which supplement the general traffic and farm-to-market service of the primary routes, and the states should stimulate such improvement by the allocation of a definite and reasonable proportion of state collected funds for such secondary system of highways or county trunk highways, if the state has not as yet made such funds available for such systems;

4. That the expenditure, however, of all such state funds, allotted for the improvement of the secondary systems or county trunk highways, should be made with such state supervision as will insure tangible, well planned, worth-while improvements, all administered on a sound business and economical basis;

5. That where state trunk highways, roads of the secondary system or county trunk highways pass through municipalities funds available for the improvement of such routes may logically be used under proper supervision for the construction and maintenance of such routes through such municipalities, but such funds should not become available to the municipalities to be used on thoroughfares which are not used by the traffic carried on such routes.

The resolutions recited that "in general it may be stated that approximately 10 per cent of the public road mileage in the several states composes the combined federal aid and state systems, which may be called primary roads, and an additional 20-25 per cent composes the principal county trunk or state aid highways, which may be called secondary roads, and the remaining 65-70 per cent composes purely local township or third class roads."

GASOLINE TAXES

On the subject of gasoline taxes the association expressed an opinion favoring "the prin-

ciple of a gasoline or motor fuel tax, which tax shall be considered as a charge for the use of the highway system; that this tax, however, shall not be in lieu of motor vehicle license fees or personal property taxes; and that such gasoline or motor fuel taxes shall be as uniform in rate in the several states as practical and consistent with the constitutions, road bond obligations or road needs of the individual states."

MORE UNIFORM MOTOR LICENSE FEES

It is declared desirable that the rate of taxation for motor vehicles in each of the several states should be as uniform as possible. To secure this a recommendation is made favoring "a fixed charge per annum by each state for each class or weight of motor vehicle, which charge shall be considered as a legal protection charge and as a 'ready to serve' charge for the highway system; that this may take the form of a motor vehicle license fee, which is in lieu of all other property taxes or a combination of personal property taxes and motor vehicle license fees; and that the total rate of such taxes for each class or weight of vehicle in the several states shall be as uniform in amount as practical and as consistent with the constitutions, road bond obligations or road needs of the individual states."

TOLL BRIDGES

The fact that toll bridge legislation is proposed in many states and in the Congress of the United States makes it necessary and desirable to reiterate and amplify the position of the association on toll bridge matters. This position is declared to be:

1. Enactment of the Burtness bill now before congress;

2. That in the meanwhile no franchise for privately owned toll bridges be granted which does not comply with the requirements of the Burtness bill;

3. That the several states be urged to continue the policy of either purchasing toll bridges or else erecting free bridges to replace toll bridges;

4. That no toll bridges be constructed except where urgent necessity exists and that provision in every case be made for redemption and making free of tolls.

FUNDS FOR ROADS THROUGH PUBLIC DOMAIN

A request is made that congress provide funds to make the Colton-Oddie bill effective. This bill provides for the construction of roads through the public domain, but no appropriation has been made to carry out its provisions.

REMOVAL OF FEDERAL AID LIMITATIONS

As the present limitation of \$15,000 per mile on federal participation in highway construction has no relation to the cost of any project, it was recommended that this be removed and that the Secretary of Agriculture be authorized to approve projects at 50 per cent of the cost of construction.

AIRWAYS AND HIGHWAYS

The full coordination of highways and airways is recommended, including the coordinated service of the personnel and equipment of the existing federal and state governmental agencies now having administration of highways and airways.

THE "BRAIDED" CROSSING, LATEST PHASE IN THE EVOLUTION OF EXPRESS HIGHWAYS

(Continued from page 7.)

In this way all traffic will leave or enter the highway on the right side, going in the same direction as the line of traffic it is leaving or entering, and the job of sorting out 3500 cars per day from a peak traffic of 18,000, without loss of speed and a minimum hazard of accidents, impresses upon us the importance of this safety measure.

The connecting link of this highway between Waldo and the Golden Gate Bridge will be completed by the time that structure is finished. Many reports of the commencement of private construction projects, just starting or soon to begin, show the impetus given by the strong sentiment expressed at the November 4th election in favor of this bridge. Upon consummation of the bridge and the highway serving it, traffic demands between Sausalito and San Rafael will be doubled and safety demands more than doubled. Only then will be realized the full value of the braided crossing, in sorting out without delay and with a minimum of hazard some 20 per cent of its traffic.

PARIS—An appropriation of 700,000,000 francs, or about \$27,510,000, was voted recently by the municipal council of Paris. The money will be used in widening roads leading into the city and in building new roads connecting the suburbs.

PENNSYLVANIA—Samuel Eckels, chief engineer of the state highway department and president of the American Association of State Highway Officials, recently appointed a committee of highway officials from eight states to study toll bridges for testimony before a Congressional committee.

KEEP SCRAPPIN'

When you're sick as the deuce, and you think, "What's the use?"

And you're tired out, discouraged, afraid;
And you keep asking why they don't let you die
And forget the mistakes you have made;
When you're chock full of pain and you're tired of the game,

And you want to get out of it all—
That's the time to begin to stick out your chin
And fight with your back to the wall!

When you've done all you can to scrap like a man,
But you can't keep your head up much more;
And the end of the bout leaves you all down and out,
Bleeding, and reeling, and sore;
When you've prayed all along for the sound of the gong

To ring for the fight to stop—
Just keep on your feet and smile at defeat;
That's the real way to come out on top!

When you're tired of hard knocks and you're right on the rocks,

And nobody lends you a hand;
When none of your schemes, the best of your dreams
Turn out in the way you'd planned;
And you've lost all your grit and you're ready to quit,
For life's just a failure for you,
Why, start in again, and see if all men
Don't call you a MAN through and through!

—ESTY QUINN, in *Progress*.

CONCLUSIONS ON S. F. BAY BRIDGE PROJECT ANNOUNCED BY HOOVER-YOUNG COMMISSION

(Continued from page 8.)

The traffic centers are slowly moving southward.

Growth of automobile traffic may be expected to steadily increase at the rate of 5 per cent to 6 per cent for the next eight or ten years and thereafter at approximately the rate of population growth, which is about 3 per cent per annum.

Income is computed on approximately this basis. Growth of interurban traffic can not be expected to any great extent.

Probable revenue from tolls which may be expected over a centrally located bay crossing carrying both auto and electric line passengers in 1940 is approximately \$7,400,000 per year. It is estimated that this will increase at the rate of 3 per cent per annum.

Bill Johnson sleeps beneath this lid—
He always claimed he couldn't skid—
The fact remains, he could—and did!

Bill: It's tough when you have to pay 50 cents a pound for meat."

Will: "Yes, but it's tougher when you have to pay 25 cents a pound."

Progress on Dam
Inspection



Flood Control and
Reclamation
Activities

November Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Preparing for Snow
Surveys



Barrier and Water
Resources
Investigation

DAMS

The activities of this department have been directed during this period not only to studying and inspecting existing dams, but also to work on new construction and repairs.

To date 720 applications for approval of existing dams have been filed; 54 applications for approval of plans for construction or enlargement of dams; and 94 applications for approval of plans for the repair or alteration of dams.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OR ENLARGEMENT

Dam	County	Owner	Est. Cost
*Tiger Creek Afterbay	Amador and Calaveras	Pacific Gas and Electric Co.	\$350,000
*Digger Creek	Shasta	G. L. Childs & A. P. Waller	2,517
*Dennis Martin No. 2	San Mateo	A. Schilling	1,200
*Kathriner Siskiyou	Siskiyou	Frank Kathriner	9,000
**Port Costa Reservoir	Contra Costa	California Water Service Company	5,434

*New.

**Enlargement.

The Tiger Creek Afterbay is to be a variable radius arch dam on the North Fork of the Mokelumne River and will link Amador and Calaveras counties. It will be 85 feet high and store 3800 acre feet of water which will help regulate the flow and divert it for power purposes in the Pacific Gas and Electric system.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR REPAIRS OR ALTERATIONS

Twenty-eight such applications have been received during this period, indicating the cooperation of owners in their desire to put their dams in the shape required by the department.

PLANS APPROVED FOR ENLARGEMENT, REPAIR OR ALTERATION

One application for enlargement and 20 for repair or alteration have been approved by the State Engineer.

Orders authorizing use pending formal approval were issued to the following owners of dams:

Dam	County	Owner
Kelly Lake	Placer	Pacific Gas and Electric Company
Lower Blue Lake	Alpine	Pacific Gas and Electric Company
Meadow Lake	Alpine	Pacific Gas and Electric Company
Twin Lakes	Alpine	Pacific Gas and Electric Company
Upper Blue Lake	Alpine	Pacific Gas and Electric Company

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Routine maintenance work has been carried on in connection with the flood control project during this period, consisting of clearing second growth timber in the by-pass, overhauling pumping plants and structures, and other miscellaneous work. An average of fifteen men have been employed during this period.

FLOOD CONTROL PROJECT MAINTENANCE BANK PROTECTION

Construction has been commenced on one tree current retard in cooperation with Reclamation District No. 70 at the Yates place, approximately four miles south of Meridian, to cost \$2,100. Bank protection work, also in cooperation with this district, at Girdner Bend has been commenced. This will cost \$800.

At Andrus Island, on the Reardon ranch, 220 feet of bank is being protected with rock in cooperation with the Division of Highways and Reclamation District No. 556. This work will cost \$2,300. All other bank protection work under way has been completed.

Surveys were completed for bank protection work near Compton Landing, on the left bank of the Sacramento River nine miles above Colusa, for the Colusa Bank, but it has been decided that no construction will be undertaken this year.

SACRAMENTO FLOOD CONTROL PROJECT

Three crews have been engaged during the period in clearing in the Lower Sutter, Butte Slough and Tisdale by-passes, and two camps have been in operation. An average of 64 men have been employed. The five contracts for clearing in the Feather River bottoms near Marysville have been completed.

Much detail work has been done in connection with the flood control construction program for the current year, and various surveys have been made. Plans have been prepared for various units of the work and rights-of-way have been negotiated for and various rights secured.

The California Debris Commission has let contract for the Lake of the Woods extension levee, 8700 feet long, at a price of \$85,500. Bids have been called and received for various other units of the work, but contracts have not been let. The Feather River levees at Starr Bend and Lake of the Woods have been completed, and construction is now under way on Lake of the Woods extension levee. With the completion of this levee Reclamation District No. 784 will be closed and protected for the winter.

Surveys have been continued of the timber areas and cut-over areas in the by-passes.

EMERGENCY FLOOD CONTROL AND RECTIFICATION OF RIVERS

In cooperation with Andrus Island Reclamation District No. 317 the San Joaquin River levee between Seven Mile Slough and Mokelumne River has been reconstructed and protected for a length of 3500 feet. The work is complete except for the placing of 2500 tons of rock. A total of 5400 tons of rock will be used. The cost of the entire work will be approximately \$20,000.

Some additional tree protection has been installed in the San Joaquin River at Tom Paine Slough, in cooperation with California Irrigated Farms at a cost of \$700.

The channel of Big Chico Creek in Butte County has been cleared of obstructions for a length of 6000 feet at a cost of \$900, in cooperation with the Division of Parks and Butte County.

SANTA MARIA RIVER

The clearing work in the channel of the Santa Maria River near Guadalupe, which was commenced on September 22, 1930, was completed on November 8th. The channel was cleared for a length of about six miles to a width of 370 feet at a cost of approximately \$7,000, an average of 50 men having been employed during the course of the work. This was done in cooperation with the counties of Santa Barbara and San Luis Obispo.

PAJARO RIVER FLOOD CONTROL

A contract has been let to Karstedt and Karstedt of Watsonville for improvement in the channel of the Pajaro River for a length of 8600 feet at a cost of \$2,850. This work consists of clearing a width of 60 feet and loosening the bottom material.

SALINAS RIVER

Actual work in excavating the channel to connect the Salinas River with Elkhorn Slough was commenced on October 27th and continued for two days, when the work was discontinued so that the right to proceed could be determined in court. This work is being done for the Division of Fish and Game.

MOKELUMNE RIVER

A foreman and three men have been engaged in burning debris left from the clearing of last year, preparatory to proceeding with the improvement work in cooperation with the county of San Joaquin. The extent to which this work will be carried has not yet been determined.

FLOOD MEASUREMENT AND GAGES

The recording gages to be operated during the winter by this office have been inspected, repaired and put into operation, and preparations have been made for taking flood measurements in the various channels during the winter.

During the period October 15th to November 15th an average of 133 men have been employed in the above described work, exclusive of contractors' employees.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

During the month of October 14 applications to appropriate were received; 9 were rejected and 21

approved. During the same period 19 permits were revoked and 4 licenses were issued.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in superior court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All-American Canal from Colorado River.

North Cow Creek (Shasta County). Referee's final report being prepared.

Oak Run Creek (Shasta County). Case pending in the superior court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in superior court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the superior court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Action by referee deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County). The report of referee has been prepared for submission to the superior court of Modoc County.

Mill Creek (Modoc County). A report is in course of preparation covering the administration of the tentative schedule of allotments which was authorized for the 1930 season.

Deep Creek (Modoc County). The report covering the field investigation of water supply and use of water is being prepared.

Franklin Creek (Modoc County). The field investigation of water supply and use of water for the 1930 season was discontinued on October 15.

WATER DISTRIBUTION

Pit River (Modoc and Lassen Counties). Supervision over diversions from Pit River in Big Valley was discontinued on October 15.

CALIFORNIA COOPERATIVE SNOW SURVEY

Field work has occupied the time on this work almost entirely during the past month. This practically completes the fall work comprising the necessary arrangements for the surveys to be made in the spring. These arrangements have included the outline of plans with cooperating agencies, selection of personnel for the surveys, stocking of shelter cabins, distribution of equipment, forms, etc.

In the Tahoe-American Basin a trip was made to the Ward Creek and Rubicon Peak snow courses to clear up brush and rocks at measuring points and to more plainly mark the courses.

Arrangements for the shelter cabin near Church Meadows on the divide between Feather and Yuba Basins were completed. Plans for the Bowman Lake area surveys were checked with the Nevada Irrigation District. Arrangements for experimental precipitation observations by two separate methods, one being that of the U. S. Weather Bureau, were effected for the station at Rasers Lodge in the American Basin.

A trip was made to relocate and brush out the Snow Mountain snow course in the Pit Basin and work was completed at the snow courses in Lassen Volcanic National Park, where it was necessary to mark the courses with pipe standards.

Until the surveys at key courses begin at the end of January, the snow survey work will now be confined chiefly to the large amount of office computations necessary in preparations for the correlation of snow survey data with runoff when the data from the surveys become available.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued during the past month and with the submission of this report the field work will be completed except for the maintenance of salinity stations and tide gages. Future office work will be confined to the compilations necessary in the preparation of the 1930 report.

Salinity investigations have been continued through the maintenance of sampling at forty-six stations in Bay and Delta areas. With the decrease in salinity at up-river stations, it is planned to stop the sampling at a number of stations. This will only be done when the salinity remains at about three parts of chlorine per 100,000 or less. At least fifteen stations will be maintained permanently and the North San Pablo Bay stations will be continued throughout the winter.

During the past month the army engineers have taken back the maintenance of the Benicia tide gage and the water supervisor's office is therefore maintaining eight tide gage stations.

The following are comparative data for 1929 and 1930:

Station	Salinity in parts of chlorine per 100,000	
	10/28/30	10/28/29
Bullhead Point	1080	1140
O and A Ferry	240*	450*
Collinsville	100	240
Antioch	140	204
Jersey	10**	60**
Emmerton	4**	21**
Rice Pump	7	11
Rio Vista	2	2
Isleton	1	---

*October 26th.

**October 30th.

Station	Discharge in second-feet	
	10/28/30	10/28/29
Sacramento River at Sacramento	6350	5600
San Joaquin River near Vernalis	1450	1290
Combined flow to Delta	7800	6890

WATER RESOURCES

SALT WATER BARRIER INVESTIGATION

Substantial progress has been made during the past month on the investigations of the economic aspects of the proposed salt water barrier. The industrial survey of the upper San Francisco bay area with special reference to the proposed salt water barrier has been completed and a report rendered by a special committee composed of Dean W. E. Hotchkiss, Stanford Graduate School of Business, as chairman; Dean H. S. Grady, College of Commerce, University of California; and Mr. A. D. Schindler, consulting engineer. This report presents the results of about six months of intensive studies and investigations of the industries within the area which would be affected by the proposed barrier, and is one of the most important parts of the investigation of the economic aspects of the barrier.

Other special reports and investigations which have now been completed include the study of sewage and industrial waste pollution in relation to the quality and redeemability of fresh water in the proposed barrier lake, the effect of the barrier on the fishing industry, the geology of the region adjacent to the salt water barrier sites, the feasibility and suitability of the proposed salt water barrier as a highway crossing and evaporation and transpiration from the proposed barrier lake.

Detail studies have been completed on the yield of the proposed barrier lake, with special regard to its conservation value. Studies were continued on the agricultural developments of irrigation and reclamation as related to the barrier, with special investigations of the present and estimated future needs of the areas adjacent to the proposed barrier lake and studies of sources and methods of supply to take care of present and future demands. This includes a specially intensive study of a proposed conduit extending from the Delta along the south side of Suisun Bay to serve the industrial and agricultural demands in Contra Costa County and immediately take care of any shortages which now exist.

Special studies covering the design and cost of the proposed barrier at various sites have been continued during the past month with special reference to the provisions for locks and flood gates in the proposed structure. Studies have also been continued on the effect of the proposed barrier to the present reclamation developments especially in the delta of the Sacramento and San Joaquin rivers.

The results of the investigations completed up to this time were carefully reviewed by the Consulting Committee on the salt water barrier investigation at a regular meeting held on November 3. Preliminary conclusions on several of the important aspects of the investigation were under discussion by the Consulting Committee. Work is now actively under way on the preparation of the complete report of the investigation.

SACRAMENTO VALLEY INVESTIGATION

Yield Studies. Studies were made to determine the irrigation yield of the Table Mountain reservoir with three heights of dam and also to determine the irrigation yields of the Kennett reservoir operating in combination with the Table Mountain reservoir.

Studies were also made to determine the yields of the Kennett reservoir and the Table Mountain reservoir with a capacity of 3,000,000 acre-feet in each case operating for irrigation on the Sacramento River, navigation, salinity control at Antioch and irrigation supplies to the San Joaquin Valley and delta area. A similar study was started for the American River units.

Studies to determine the power output of the reservoir operating primarily for power were completed for the Auburn, Coloma and Folsom reservoirs and the Pilot and Webber Creek plants and from the Narrows and Table Mountain reservoirs.

Additional studies were made to determine the value of power from the Kennett, Narrows and Oroville plants operating both primarily for power and as initial units.

Studies to determine the economic installation at the Folsom, Pilot, and Webber Creek plants were made.

Water Requirements. A revision was made of certain of the water service areas so that they can be given a dependable supply for all of the irrigable areas from the water supply of the stream from which they are served.

Flood Flow Investigations. Studies of the flood flow concentrations of five points in the Sacramento

Valley were slightly revised and a final report covering this subject was written.

Studies for the determination of the flood frequencies at the foothill gaging stations on the main streams in the Sacramento River Basin and curves of the reservoir space required to control floods at these same points were completed.

Ground Water Studies. Measurements of the depth to water in a large number of wells over the entire Sacramento Valley floor were completed with the exception of two or three wells. These measurements have been taken to determine the ground water condition in the fall of 1930.

Storage Works. A meeting of the Sacramento Engineering Advisory Committee was held at which the detailed cost estimates for the irrigation reservoirs for the major units of the State Plan were discussed and approved. An inspection trip was also made by the committee to view the latest geological explorations at the Kennett and Table Mountain dam sites.

A thorough investigation was made by Dr. Ransome of the exploration work and the geology at both the Kennett and Table Mountain sites. Work on seven test pits and one tunnel at the Table Mountain dam site was completed by the contractor during the month and bids were called for by the U. S. Engineer Office on the drilling of nine test holes at the Table Mountain dam site.

Estimates of the cost of power features were completed for the Kennett, Oroville, Narrows, Folsom, Auburn and Coloma reservoirs.

SAN JOAQUIN VALLEY INVESTIGATION

Water Supply. Yield studies of San Joaquin River at Friant Reservoir, Kings River at Pine Flat Reservoir, Kern River at Isabella Reservoir, Tule River at Pleasant Valley Reservoir, and Kaweah River at Ward Reservoir were completed for use in connection with the solution of the economic capacities of these various developments.

An estimate has been made of the flow to the San Joaquin Delta from the San Joaquin Basin under assumed conditions of the diversion of the grass land and surplus waters.

Land Classification. Final check and summary of land classification areas of the Upper and Lower San Joaquin Basin have been completed and base map extended to cover supplementary foothill classifications. A new key map has been prepared.

Ground Water Investigation. Base map of the Upper San Joaquin Valley has been completed and a similar map for the Lower San Joaquin Valley is half finished. Maps of lines of equal total lowering for the period 1921 to 1929 for Upper San Joaquin Basin are complete. Computations of ground water depletion and graphs showing the relation between ground water fluctuation and inflow for the various Upper San Joaquin Valley divisions were made. Report of Mr. Hyde Forbes on the absorptive areas of the San Joaquin Basin was completed and computations made on the absorptive capacities of the Madera, Mormon Slough and Mokelumne areas.

Economic Studies. Economic studies of proper relation between storage capacity at Friant and canal capacity for diversion of water to Upper San Joaquin Valley and of storage on the Kings River at Pine Flat and the Kern River at Isabella have been completed. The economic capacities of power development at Friant and Pine Flat have been determined.

Reservoirs. Final plans, details, tracings and cost estimates of storage reservoir at Friant site on San Joaquin River have been completed and tracings of Windy Gap and Buchanan dam sites, and Fresno Flat reservoir have been made. Also plane table

survey of Ward Dam site on scale 100 ft. per inch, completed.

Cooperative Work with U. S. R. B. Temperance Flat dam site plane table survey scale 100 ft. per inch and differential levels from Friant to Kerechhoff Reservoir completed during the present month.

General. Folio of data covering results of studies to date, prepared and submitted to Engineering Advisory Committee at meeting held October 22d and 23d. A trip of inspection was made by members of the Engineering Advisory Committee to various dam sites on San Joaquin River tributaries November 5th, 6th and 7th.

MOJAVE RIVER INVESTIGATION

Progress report for the year 1930 was practically completed during the month. There have been many demands that this office drill a dam site on the West Fork of the Mojave and as this is the key reservoir in control of the Mojave it is important that it should be drilled, but funds are lacking.

Three new gaging stations were installed by the U. S. Geological Survey on the Mojave under cooperative agreement during the past month.

SANTA ANA INVESTIGATION

Two meetings of the Consulting Board were held on final draft of the report which has been sent to interested parties in the Santa Ana Basin for criticism. With some minor revisions the report will be complete and ready for the printer at an early date.

VENTURA COUNTY INVESTIGATION

Typing of the progress report for the year 1930 is under way in the Sacramento office.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month. Plotting of the irrigated areas is about 95 per cent completed. Work on the resident engineer's progress report for the 1929-1930 season was commenced on October 20th.

NAPA VALLEY INVESTIGATION

During the month of October the wells under investigation in connection with this project were counted up with a line of levels. The wells were spotted as to location on a map to accompany the report and a second set of water levels was taken to cover the low level period.

SANTA CLARA INVESTIGATION

Office work in connection with the progress report covering the Santa Clara Investigation has proceeded and it is expected that a report covering the work during the past year will issue at an early date.

IRRIGATION, WATER STORAGE DISTRICTS AND BOND COMMISSION

The report on irrigation district activities for the year ending 1929 has been completed and is now ready for distribution. The State Engineer reviewed the contents of this report and announced its release at the meeting of the Irrigation Districts Association held in Stockton on November 20, 1930.

Data are now being prepared on irrigation and water storage districts for inclusion in the biennial report of the Division of Water Resources for the period 1929-1930.

Visits were made during the present month to the Butte Valley Irrigation District in Siskiyou County.

Hot Springs Valley Irrigation District in Modoc County, Brown's Valley Irrigation District in Yuba County, Nevada Irrigation District in Nevada and Placer counties and El Dorado Irrigation District in El Dorado County, to advise with their officers in connection with the maintenance and operation of these districts.

A conference was held with the officials of the Richvale irrigation district to consider proposals of the district relative to purchasing an interest in the Sutter-Butte Canal Company.

No meetings of the California Bond Certification Commission were held during the present month.

CALIFORNIA IRRIGATION AND RECLAMATION FINANCING AND REFINANCING COMMISSION

Meetings were held at Stockton August 28, Los Angeles September 19, Fresno October 3, and at San Francisco on October 10 and 17. These meetings were held to provide an opportunity for various irrigation and reclamation districts in different portions of the state to appear and submit financial problems affecting their operations.

LEGISLATIVE WATER COMMITTEE AND HOOVER-YOUNG COMMISSION

The eleventh hearing of the Legislative Water Committee and Hoover-Young Commission convened in Oakland October 27 and 28.

On October 27, a number of representatives from various sections of California appeared to submit water problems concerning their sections of the state. Each representative appearing was requested to file a brief covering his district for study by members of the two bodies.

The twelfth hearing of the same bodies convened in Oakland, November 10, when compendium of data including conclusions of investigations conducted by the Division of Water Resources was submitted. Experiments bearing upon the behavior of salt water in lock operation were attended by the committee and commission at the College of Mechanical Engineering, University of California, Berkeley, during the afternoon.

MISCELLANEOUS

The Imperial Irrigation District has been advised by the Secretary of the Interior that contracts for delivery of water in the All-American Canal can not be completed until this division has ruled on the amounts which shall be allocated to the different claimants in California. Presumably this is true also of the situation with regard to the Boulder Reservoir. It had been assumed by many interests using or proposing to use water from the Colorado River that the government would allocate the water.

A final report was completed on the extent of and use of water on riparian and overflow lands of the Sacramento and American rivers in the valley floor.

In continuation of the field trips which have been made from time to time during the past year by representatives of the state, the U. S. Army Engineers and the U. S. Geological Survey for the location of gaging stations, a trip was made during the past month for the location of gages on the Sacramento

and McCloud rivers. Locations were made on the Sacramento River at Antler and on the McCloud River at Baird and the Hearst Estate near McCloud. The Baird and Antler stations have been maintained previously by staff gages and observers, but provision is now made for the installation of automatic water registers. The Hearst station is entirely new. This work is a part of the program for the location of some eighteen new gaging stations and the installation of recorders at eighteen old stations throughout the Sacramento-San Joaquin drainage basin in accordance with a federal-state cooperative agreement.

NOVEMBER REPORT OF DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

MOTOR VEHICLE REGISTRATION GAINS

The registrations for the first ten months of 1930 compared against the same period of 1929 show a gain in registrations of automobiles 63,399, pneumatic trucks 15,738, pneumatic trailers 6719, and a loss in solid trucks of 5650, motorcycles 142, and solid trailers 1036. In the first ten months of 1929 we reported 564,379 transfers, against 492,787 in 1930. This apparent reduction of 71,592 is in reality the difference due to the reduction in transfer fees occasioned by the change in the law reducing transfers in some cases from \$2 to \$1.

As of November 1st, the Division has registered the following number of vehicles as to classification:

Automobiles	1,916,037
Solid trucks	15,442
Pneumatic trucks	81,556
Motorcycles	9,198
Solid trailers	9,477
Pneumatic trailers	38,037
Transfers	492,787

During the first ten months of 1930 the Division has issued 75,901 nonresident permits, which is 5171 more than were issued in the same period of 1929.

As of November 14, 1930, 34,894 state, county, city, public service and U. S. automobiles, motorcycles and trailers have been registered. This is an increase in total over 1929 of 2227.

DRIVE AGAINST FAULTY LIGHTS

During the past month the Bureau of Lights of the California Highway Patrol has launched another extensive drive against glaring headlights, as well as vehicles being operated with one headlight and no taillight. During the month of October, 20,837 vehicles were reported tested on testing screens by officers of the patrol. Of this number 6335 were found in violation of the law and arrest citations were issued. In Los Angeles County two inspectors were assigned for duty with the police departments of twenty-two small cities, and 8343 vehicles were tested, of which 2331 were given arrest citations. The city of Los Angeles has advised that they will use ten officers to work continuously on lights every night in the week.

BRAKE INSPECTION ACTIVITIES

The Bureau of Brakes reports shows a substantial number of cars tested last month and a slight decrease in the percentage of defective brakes. In addition to handling many questions of a technical nature concerning the mechanical and legal regulations of com-

mercial vehicles, the Bureau handled their regular routine of reports, applications, etc. The following is a resume of brake and truck activities for the month of October:

Number of new applications for brake adjusting stations.....	33
Total number of applications received to date.....	1638
Total number authorized.....	1197
Total number pending and incomplete.....	441
Number of adjusters authorized.....	2703
Total number of communications.....	101

Brake Tests.

Number found defective.....	1040
Number found satisfactory.....	8561
Total number of brakes tested.....	9601
Percentage found defective.....	10%

Trucks.

Number of trucks checked.....	1884
Number of trucks warned.....	898
Number of trucks arrested.....	544
Number of trucks arrested in October, 1929.....	170

LICENSE APPLICATIONS

During the month of October 35,637 applications for operator's and chauffeur's licenses were received. Of this number 29,144 licenses were issued. The remaining number failed to pass the examination at their first attempt.

HIGHWAY PATROL SCHOOL

The fifth class of the California Highway Patrol Training School, composed of 49 men, reported for instructions on October 4th. This class was composed entirely of new men or men appointed subsequent to the passage of the 1929 act.

Notice has been received from the War Department that the lease on the barracks and dining hall at Mather Field has been canceled. The commanding officer of the field, however, has permitted the school to remain until such time as the buildings are actually needed.

During the month of October the men in the Highway Patrol covered a total mileage of 568,592 miles.

DIVISION OF ARCHITECTURE

Awards for Month of November

AGNEWS STATE HOSPITAL.—Contract for general work on ward, kitchen and steam plant building, which includes additional wing, awarded to J. F. Shepherd of Stockton, \$207,961; contract for electrical work, to Roy M. Butcher, San Jose, for \$7,629; contract for heating, ventilating and plumbing, to Hately and Hately of Sacramento, \$11,880.

TEN-YEAR BUILDING CONSTRUCTION PROGRAM FOR STATE INSTITUTIONS

(Continued from page 13.)

were made and plot plans for the ultimate institutions developed by the Division and approved, before further steps were taken, with the result that orderly building construction programs are now under way. The college will move into \$750,000 worth of new structures during January, 1931, and the Institution for Women will move into its first new buildings, which it is expected may include some structures to be provided for by the 1931 Legislature, during the latter half of 1931.

Numerous suggested sites have been examined for the new prison for first offenders and the hospital for insane, and final selections will soon be made. Orderly, effective, long time building programs based on all the considerations involved in the ultimate institutions, will be made in these cases.

Governor Young's wise and far-seeing policy referred to at the outset of this statement has been abundantly justified by results already and so soon obtained.

War on illegal signs along the highways has been declared by the Department of Highways in Pennsylvania. Caretakers of the department have just completed the destruction of 32,225 roadside signs embodying every type of blur, daub, scrawl and tattered legend that came within the definition of illegal advertising.

An old man went to a rejuvenation specialist and asked how much it would cost to rejuvenate him.

"To make you feel like 30 again, it will cost you \$1,000," said the surgeon, "but to make you look like 25 again will cost \$2,000, and anything below that age will be \$5,000."

"I don't care about the cost; just make me 15 again," said the oldest.

The operation was a success. But when the surgeon sent in his bill, the rejuvenated one sent it back with this notation:

"You can't collect from a minor!"

NOVEMBER REPORT OF DIVISION OF ARCHITECTURE

GEORGE B. McDUGALL, Chief

During November contracts have been awarded totaling \$222,218.86. The projects included in these contracts include the construction of a ward, kitchen and steam plant building at the Agnews State Hospital; a receiving ward building and auditorium at the State Narcotic Hospital; a hatchery building, superintendent's cottage and improvements to the water and sewer system at the Alhambra Fish hatchery.

Projects now out for bids have an estimated total cost of \$295,250. These include a men's gymnasium at the San Jose Teachers College; an industrial building and a hospital building at the Stockton State Hospital; a superintendent's cottage at the Preston School of Industry, and a physician's cottage at the Agnews State Hospital.

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON NOVEMBER 6th

C. H. PURCELL, Chief of Division of Highways.

PROGRESS OF WORK

Between October 28th and November 25th contracts have been awarded and work advertised as follows:

Work placed under contract.....	\$768,800
Contracts pending and projects advertised.....	2,011,400
Total	\$2,780,200

COMPLETED PROJECTS

Among the contracts which have been completed during the past month the following are included:

Foothill Boulevard.

In Los Angeles County the heavily traveled Foothill boulevard between Los Angeles and San Bernardino has been widened and resurfaced from Citrus avenue, in Azusa, to Glendora. This contract consisted of building up the shoulders to a roadbed width of 56 feet and placing an asphalt concrete pavement 30 feet wide, giving a three-lane pavement with 13-foot shoulders on the mile of state highway between these two cities. This improvement was made at a cost of \$44,600.

Owens Valley Highway.

Costing \$254,500, over twenty-one miles of the highway through the Owens Valley has been constructed to modern standards of desert highway improvement. The sector of this highway covered in this project extended from Coso Junction, about 68 miles north of Mojave, to Olancha, along the Haiwee Reservoir of the Los Angeles water supply. The work consisted of placing a 20-foot oil treated crushed rock surface on a standard roadbed 36 feet wide. This project completes the improvement in Inyo County from the southerly boundary to Alabama Gate, about 11 miles south of Independence.

A short section of this highway, as it traverses the high Sierra to the east of the divide, has been revised in alignment and grade at a cost of \$58,800. This improvement covered the sector from the Matty Ranch to Leeving in Mono County, a distance of about two miles. The roadbed was constructed 24 feet wide and surfaced with bituminous crusher run base 20 feet wide.

Cuyama Lateral.

The easterly end of the Cuyama lateral in Kern County has just been reconstructed on a new alignment for a distance of ten miles from the San Emigdio road to the Valley Route just south of Bakersfield.

This project is an improvement of a high standard of construction, consisting of a 30-foot graded roadbed with a surface of oil treated crushed rock 20 feet wide with an adequate drainage system to keep the road passable at all times. It will replace the old county road over this portion of the lateral, and joins the easterly end of the twelve miles of newly constructed and surfaced highway between Pentland Junction and San Emigdio road, which was completed in July of this year. The new road will afford a more direct route for traffic between the Valley road and the Maricopa and adjoining oil fields as well as being an important improvement on this connecting link between the San Joaquin Valley and the Coast Route at Santa Maria. The cost of the reconstruction of this ten miles amounted to \$144,600.

Truckee-Meyers Road.

Two miles of the Truckee-Meyers road as it traverses the rugged granite slopes along the shores of Lake Tahoe at Emerald Bay have just been reconstructed. The improvement is located between Bay View Rest and Eagle Falls, and was graded at a cost of \$193,800. Numerous hazardous curves, steep grades and narrow sections were eliminated, making this popular highway through the Lake Tahoe resort area of suitable width and grade for safe and comfortable travel over its entire length.

Pacific Highway (West Side).

Progress on the improvement of the West Side Highway in the Sacramento Valley is noted by completion of three contracts. Two of these are on that portion of this important arterial between Williams and Maxwell in Colusa County. They consist of the widening of three reinforced concrete bridges and the construction of a 39-foot graded roadbed to the west of the existing pavement so that the center line of the ultimate paving will coincide with the center line of the recently acquired 100-foot right of way. The grading of this 8.3 miles is the first of three stages of construction in the building of the highway. The second stage, consisting of placing a heavy gravel base for the new pavement, has been started, and the pavement will be laid during the next biennium. Particular care was taken in the grading project to secure adequate drainage as the road passes through heavily irrigated rice fields. The third project on this interstate highway comprised the placing of a Portland cement concrete pavement over the five miles between Logandale and Willows, in Glenn County, as the final stage of a similar improvement. The cost of these three improvements amounted to \$242,100.

Redwood Highway.

The past month has seen the completion of nearly one million dollars worth of work and \$550,000 in projects advertised and pending award on the Red-

wood Highway. The completed contracts included five projects on various portions of this scenic coastal route extending from Ignacio in Marin County to Wilson Creek in Del Norte County.

The largest of these projects consisted of the reconstruction of the highway from Ignacio, about seven miles north of San Rafael, to Potluma in Sonoma County. This work, costing \$581,700, consisted of constructing a 36-foot graded roadbed and placing Portland cement concrete pavement 20 feet wide, except over fills where settlement is expected, the surfacing consisted of twenty feet of bituminous macadam. Several necessary betterments in line and grade were made, eliminating 6 per cent grade and short radius curves, saving some 4000 feet of length, and unsatisfactory drainage conditions were remedied.

In Humboldt County the mile and a half from the southerly boundary to Richardson's Grove was graded and surfaced with untreated crushed rock on an improved alignment and grade. The contract amounted to \$55,500.

Portland cement concrete pavement was placed on about five miles of the highway in Humboldt County covering three short sections, one at Scotia and a second from Fortuna to Loleta and the third over the half mile immediately south of Eureka. The roadbed on these three sections had been previously constructed to modern standards. This work, covered by two contracts, amounted to \$190,000, and increases the concrete pavement on the Redwood Highway in Humboldt County to approximately 35 miles.

The thirteen miles from the southerly boundary of Del Norte County to Wilson Creek was surfaced with untreated crushed rock 20 feet wide. The alignment and subgrade on this portion of the road have been brought to modern standards within recent years, and the present surfacing gives a smooth riding surface along the steep mountain slopes and through the thick forests which this section of the Redwood Highway traverses. The cost was \$95,500.

A small but much needed improvement on this route will be the replacing of the timber lift span on the bridge across Eureka Slough at Eureka, for which bids were opened during the past period. To cost less than \$5,000, this project is of a temporary character, as the complete reconstruction of this structure will be made within a few years. The present bridge was constructed by the state in 1919.

The completion of construction on the new alignment of the Redwood Highway between San Rafael and Sausalito is forecast by the advertising and opening of bids on that sector between Alto and Waldo. Bids were opened on November 19th for the construction of three miles of roadway between these two points. The graded roadbed is to be 46 and 56 feet wide, and the surfacing will be a bituminous macadam pavement 30 and 10 feet wide. This project will connect at its northerly end with that portion of this new alignment from Alto to San Rafael, upon which surfacing is now being placed. As a unit of the south portion of this relocation a project for the construction of bridge and overhead crossing at Manzanita was advertised for bids on October 20th. This structure will cross the tracks of the Northwestern Pacific Railroad and an arm of Richardson's Bay. The bridge and overhead will consist of a 56-foot plate girder lift span on concrete piers with pile foundations, a 45-foot steel stringer span on concrete bents with pile foundations and 2340 feet of timber trestle on pile and frame bents; the roadway will be 44 feet wide and paved with asphalt concrete. The cost of these two projects will be approximately \$560,000. This new routing between San Rafael and Sausalito will avoid the narrow and crooked Corte Madera

grade and materially shorten the distance between these two points.

BID OPENINGS

Other important projects for which bids have been opened during the past four weeks include the following:

Cholame Lateral.

The construction of a graded roadbed 36 feet wide and Portland cement concrete paving 20 feet wide on the Cholame Pass lateral at the grade separation near Wasco in Kern County will cost \$26,000. The steel and concrete separation structure is now being built by the Atchison, Topeka and Santa Fe Railroad, and the state will construct the highway through the subway. This project will be a marked improvement on this portion of this lateral which connects the Coast Road at Paso Robles with the Los Angeles-Sacramento highway at Famosa, just to the north of Bakersfield.

Bay Shore Highway.

Further progress on the new Bay Shore Highway, which is being built between San Francisco and San Jose as an alternate route to the coast road down the peninsula, is evidenced by the opening of bids for the construction of a reinforced concrete girder bridge across Redwood Slough at Redwood City. This structure will connect the newly constructed roadway from San Mateo to Redwood City with the section, now under construction, between Redwood City and Willow road.

A project of the first magnitude will be the erection of a steel cantilever bridge across the North Fork of the Feather River at Pulga in Butte County. Bids for placing the concrete piers and abutments were opened on November 19th, and advertising for the erection of the steel superstructure was published on the fifth of November. These projects will comprise a unit of the Oroville to Quincy lateral, which is being constructed up the Feather River Canyon. Grading of the adjoining roadway to the south of this crossing is now under way along the precipitous wall of the canyon. The deck of the highway bridge will be 170 feet above high water and 130 feet above the top of the Western Pacific Railroad bridge which passes diagonally under the state's proposed structure. The project for the substructure calls for placing two reinforced concrete abutments and two reinforced concrete piers. The erection of the superstructure will include one 359-foot steel arch span, two 62-foot plate girder spans, and one 44-foot plate girder span. The roadway width of the bridge will be 24 feet. At a cost of \$280,300 another link will be added to this new all-year highway to Quincy and Plumas County.

PROJECTS ADVERTISED

Advertisements for the past period also include the following projects:

El Centro-Yuma Highway.

Construction on six miles of the transcontinental highway which enters California via Yuma, Arizona, will consist of grading a roadbed 36 feet wide and placing 20 feet of asphalt concrete pavement between the Colorado River bridge at Yuma to Arizona in Imperial County. This project will be a much needed

improvement to the most southerly entrance to California. The new pavement will be placed on a gravel subbase, which will raise the grade of the highway sufficiently to give proper and adequate drainage.

Coast Route.

Two projects of prime importance to the improvement of the heavily traveled coast route connecting Los Angeles and San Francisco were advertised for bids during the month.

The one, in Santa Barbara County, calls for the construction of a graded roadbed and the placing of a 20-foot Portland cement concrete pavement over the three miles of this road as it passes through the picturesque Gaviota Canyon 32 miles north of the city of Santa Barbara. The project will extend from Gaviota Station to Las Cruces. The existing sharp curves and adverse grades through the canyon are to be reconstructed to modern standards of highway alignment. To accomplish this end much heavy grading along the canyon walls will be necessary. Under a separate contract a reinforced concrete arch bridge will be constructed at a crossing of Gaviota Creek.

The other project comprises the grading and paving of eleven miles of the coast route in San Luis Obispo County from Paso Robles to the Monterey County line. In this instance the pavement will be asphalt concrete, and portions will be placed over the existing 15-foot Portland cement concrete pavement. The new pavement is to be placed with a "one-way crown" so that future widening may be done on the west side away from the tracks of the Southern Pacific Railroad which parallel the highway. An important phase of this improvement is the modification of the dangerous curve at the northerly entrance to Paso Robles. As a unit of the improvement between the limits of this work will be the construction of a new bridge across San Marcos Creek. This structure will be built as a separate project, and will be advertised in the near future.

Pacheco Pass.

In Santa Clara County nearly eleven miles of the Pacheco Pass lateral is to be reconstructed from San Felipe to one mile east of Bell's Station. The present improvement will involve the placing of a 20-foot bituminous macadam pavement with eight-foot shoulders on an improved alignment and grade. This lateral, connecting as it does the Valley Route at Califa with the coast road at Gilroy, carries a rapidly increasing amount of traffic, especially high speed commercial trucking, and this work is so designed that the road may better care for the travel it is called upon to bear. The improvement is estimated to cost \$274,000.

HIGHWAY BIDS AND AWARDS

For Month of November

BUTE COUNTY—Substructure of a bridge across North Fork of Feather River at Pulga. Dist. 11, Rt. 21, Sec. C. M. H. Slocum, Los Angeles, \$34,901; Gutleben Bros., Oakland, \$34,332; E. B. Boyd, San Diego, \$36,146; Lord & Bishop, Sacramento, \$37,057; Gist & Bell, Arcadia, \$39,246; Paul M. White, Santa Monica, \$43,103; Peter McHugh, San Francisco, \$36,954; Rocca & Caletti, San Rafael, \$37,281; Ward Engineering Co., San Francisco, \$38,333; Fred J. Maurer & Son, Eureka, \$44,586. Contract awarded to R. B. McKenzie, Red Bluff, \$32,370.

HUMBOLDT COUNTY—The building of a truck shed at Garberville maintenance station. Dist. 1, Rt. 1, Sec. A. Mercer-Fraser Co., Eureka, \$5,460; Oliver S. Ahlrie, Crescent City, \$5,983. Contract awarded to McCarthy & Johanns, San Francisco, \$4,188.

KERN COUNTY—Improvement of maintenance station at Delano; Dist. VI, Rt. 4, Sec. F. Currie & Duglar, Bakersfield, \$2,498. Contract awarded to R. Hodgson & Sons, Porterville, \$1,935.

KERN COUNTY—Near Wasco, about 0.2 of a mile to be graded and paved with Portland cement through underpass. Dist. VI, Rt. 33, Sec. D. Hartman Construction, Bakersfield, \$22,894. Contract awarded to Valley Paving and Construction Company, \$22,819.50.

KERN COUNTY—Four timber bridges from 17 to 21 miles west of Wasco, 1 composed of 12 19-ft. spans, 2 composed of 2 19-ft. spans and 1 composed of 4 19-ft. spans with concrete footings. Dist. VI, Rt. 33, Sec. C. Finnell Co., Inc., Sacramento, \$32,242; Donald E. Metzger & Son, Los Angeles, \$30,458; V. R. Dennis, San Diego, \$25,728; Gist & Bell, Arcadia, \$29,735; Geo. J. Ulrich, Modesto, \$26,714; R. B. McKenzie, Red Bluff, \$25,870; G. A. Graham, Bakersfield, \$25,682. Contract awarded to M. H. Slocum, Los Angeles, \$25,118.20.

LOS ANGELES COUNTY—Between La Canada and 2½ miles north, 2.4 miles to be oiled. Dist. VII, Rt. 61, Sec. A. Leonard C. Pulley, Long Beach, \$6,135; P. J. Akmadzieh, Los Angeles, \$6,338; Geo. Gardner & Sons, Redlands, \$7,135; Southwest Paving Co., Los Angeles, \$8,048; H. E. Cox & Son, Pasadena, \$12,431. Contract awarded to Charles A. Ladeveze, South Gate, \$5,633.75.

LOS ANGELES COUNTY—Reinforced concrete girder bridge over the A. T. & Santa Fe R. R. at Manhattan Beach. Dist. VII, Rt. 60, Sec. C. Bodenhamer Const. Co., San Diego, \$33,155; Herbert M. Baruh, Los Angeles, \$29,936; Houghton & Anderson, Los Angeles, \$31,196; Carpenter Bros., Beverly Hills, \$32,230; Oberg Bros., Los Angeles, \$32,509; J. S. Metzger and Son, Los Angeles, \$29,969; O. A. Gierlich, Monrovia, \$31,913; Ralph E. Hamann Co., Los Angeles, \$35,821; General Engineer Corp., Los Angeles, \$39,611. Contract awarded to Robert F. McKee, Los Angeles, \$29,785.

MARIN COUNTY—Between Alto and Waldo, 3 miles to be graded and surfaced with bituminous macadam. Dist. IV, Rt. 1, Sec. C. H. W. Rohl Co., Los Angeles, \$197,904; E. C. Coats, Sacramento, \$194,062; Lewis Const. Co., Los Angeles, \$204,012; O. A. Lindberg, Stockton, \$236,776; Peninsula Paving Co., San Francisco, \$189,725; M. J. Beyanda, Stockton, \$198,086; Skeel & Graham Co., Roseville, \$259,128; W. H. Hauser, Oakland, \$262,724; Finnell Co., Sacramento, \$293,557; D. McDonald, Sacramento, \$329,875; R. G. Le Tourneau, Inc., Stockton, \$217,986; Hemstreet & Bell, Marysville, \$239,635; Frederickson & Watson Const. Co., Oakland, \$201,586; Healy-Tibbitts Const. Co., San Francisco, \$208,850; Utah Const. Co., San Francisco, \$277,032; Guy F. Atkinson Co., San Francisco, \$253,202; George Pollock Co., Sacramento, \$223,782; J. F. Knapp, Oakland, \$225,257. Contract awarded to Granfield, Farrar and Carlin of San Francisco for \$189,633.40.

SAN LUIS OBISPO COUNTY—Repairs to San Carpojo Creek bridge. Dist. V, Rt. 56, Sec. A. Wm. Lane, Paso Robles, \$10,520. Contract awarded to San Atlas Const. Co., San Luis Obispo, \$9,483.25.

SAN MATEO COUNTY—Reinforced girder bridge across Redwood Creek, near Redwood City, consist-

ing of three 35-foot spans and one 22-foot span on concrete pile bents. District IV, Rt. 68, Sec. C. A. W. Kitchen, Piedmont, \$39,267; R. B. McKenzie, Red Bluff, \$37,141; Healy-Tibbitts Const. Co., San Francisco, \$41,800; H. C. Venson & Co., San Francisco, \$41,224; C. J. Nystedt, Oakland, \$43,633; Geo. J. Ulrich, Modesto, \$37,289; Fredrickson & Watson, Oakland, \$38,097; Ben C. Gerwick, Inc., San Francisco, \$33,117. Contract awarded to Bolenhamer Const. Co., San Diego, \$35,756.

SANTA BARBARA COUNTY. At Nojoqui Creek, about 0.3 of a mile to be graded and paved with Portland cement concrete (approaches to new bridge). Dist. V, Rt. 2, Sec. D. Cornwall Const. Co., Santa Barbara, \$31,006; W. A. Dontanville, Salinas, \$28,349; Santa Maria Const. Co., \$25,273. Contract awarded to Macco Const. Co., Clearwater, \$22,518.50.

WATER APPLICATIONS AND PERMITS

Application for Permit to Appropriate Water Filed with the Department of Public Works, Division of Water Resources, During the Month of November, 1930.

NEVADA COUNTY.—Application 6824. Gordon M. Bettles, Box 863, Nevada City, Cal., for 3.0 c.f.s. from South Fork of Poorman Creek tributary to South Fork of Yuba River to be diverted in Sec. 15, T. 18 N., R. 11 E., M. D. B. and M., for power purposes (290 h.p.). Estimated cost \$5,000.

RIVERSIDE COUNTY.—Application 6825. Edward Molitor, Keen Camp, Riverside County, Cal., for 0.05 c.f.s. from unnamed stream tributary to San Jacinto watershed to be diverted in Sec. 26, T. 5 S., R. 3 E., S. B. B. and M., for irrigation and domestic purposes (20 acres). Estimated cost \$600.

MONO COUNTY.—Application 6826. Dr. J. A. Jeffery, c/o Preston & Braucht, 309 Canal of Italy Bldg., Merced, Cal., for 1.0 c.f.s. and 300 ac. ft. per annum from Milner Creek tributary to Hamill Valley watershed to be diverted in Sec. 15, T. 4 S., R. 33 E., M. D. B. and M., for irrigation purposes. Estimated cost \$2,500.

TRINITY COUNTY.—Application 6827. Humboldt Placer Mining Co. (a corp.), by Geo. E. Waggoner, attorney in fact, 427 East McClelland Ave., Stockton, Cal., for (1) 100 c.f.s., (2) 25 c.f.s., (3) 40 c.f.s., (4) 10 c.f.s., from (1) Stuart's Fork of Trinity River, (2) Owens Creek, (3) Van Matre Creek, (4) Slate Creek, tributary to Trinity River to be diverted in (1) Sec. 20, T. 37 N., R. 9 W., M. D. B. and M., (2) Sec. 12, T. 35 N., R. 10 W., M. D. B. and M., (3) Sec. 24, T. 35 N., R. 10 W., M. D. B. and M., (4) Sec. 4, T. 34 N., R. 9 W., M. D. B. and M., for mining and domestic purposes.

PLACER COUNTY.—Application 6828. Archie L. Ward, Lincoln, Placer County, Cal., for 0.25 c.f.s. from unnamed spring tributary to Coon Creek and Sacramento River to be diverted in Sec. 1, T. 13 N., R. 6 E., M. D. B. and M., for irrigation and domestic purposes (38.17 acres). Estimated cost \$1,000.

TUOLUMNE COUNTY.—Application 6829. Turlock and Modesto Irrigation Districts, c/o R. V. Meikle, Chief Engineer, Turlock, Cal., for (1) 150 c.f.s., (2) 200 c.f.s., and (3) 27,000 ac. ft. per annum. Total from all sources not to exceed \$0,000 ac. ft. for storage from (1) Middle Fort Tuolumne River, (2) South Fork Tuolumne River, (3) Big Creek tributary to Tuolumne River to be diverted in (1) Sec. 22, T. 1 S., R. 18 E., M. D. B. and M., (2) Sec. 34, T. 1 S., R. 18 E., M. D. B. and M., for power purposes (56,951 h.p.). Estimated cost \$1,885,000.

SAN DIEGO COUNTY.—Application 6830. La Mesa, Lemon Grove and Spring Valley Irrigation District, c/o E. P. Hyatt, La Mesa, San Diego County, Cal., for 50 c.f.s. and 18,000 ac. ft. per annum, from Santa Ysabel Creek tributary to San Dieguito River to be diverted in Sec. 19, T. 12 S., R. 3 E., S. B. B. and M., for municipal purposes.

SAN DIEGO COUNTY.—Application 6831. La Mesa, Lemon Grove and Spring Valley Irrigation District, c/o E. P. Hyatt, La Mesa, San Diego County, Cal.,

for 50 c.f.s. and 18,000 ac. ft. per annum, from Santa Ysabel Creek tributary to San Dieguito River to be diverted in Sec. 19, T. 12 S., R. 3 E., S. B. B. and M., for irrigation and domestic purposes.

HUMBOLDT COUNTY.—Application 6832. Emmett Lewis, c/o Maple Creek Stage, Korb, Cal., for 0.662 c.f.s. from unnamed spring tributary to Mad River to be diverted in Sec. 7, T. 3 N., R. 4 E., H. B. and M., for irrigation and domestic purposes (3 acres).

SISKIYOU COUNTY.—Application 6833. Fred J. Blakeley, c/o Butler, Van Dyke, Desmond & Harris, Attorneys, Capital National Bank Bldg., Sacramento, Cal., for 25 c.f.s. and 4000 ac. ft. per annum, from Elliott Creek tributary to Applegate River, Oregon, to be diverted in Sec. 24, T. 45 N., R. 10 W., M. D. B. and M., for irrigation purposes (6000 acres). Estimated cost \$50,000.

SIERRA COUNTY.—Application 6834. Langdon Smith, c/o R. F. Taylor, Downieville, Cal., for 0.903 c.f.s. from unnamed spring tributary to Spanish Ravine and North Fork Yuba River to be diverted in Sec. 5, T. 19 N., R. 10 E., M. D. B. and M., for domestic purposes. Estimated cost \$500.

HUMBOLDT COUNTY.—Application 6835. Benbow Power Co., Benbow, Humboldt County, Cal., for 320 c.f.s. from South Fork of Eel River tributary to Eel River to be diverted in Sec. 36, T. 4 S., R. 3 E., H. B. and M., for power purposes (982 h.p.).

MARIPOSA COUNTY.—Application 6836. Mrs. Estelle I. Fraser of Coulterville, Mariposa County, Cal., for 39 c.f.s. from North Fork of Merced River tributary to Merced River to be diverted in Sec. 7, T. 3 S., R. 18 E., M. D. B. and M., for power purposes (161 h.p.).

MONTEREY COUNTY.—Application 6837. Henrietta T. Austin, P. O. Box 522, Salinas, Cal., for 0.075 c.f.s. from unnamed stream tributary to Carmel River to be diverted in Sec. 2, T. 17 S., R. 2 E., M. D. B. and M., for irrigation and domestic purposes (4 acres).

SAN DIEGO COUNTY.—Application 6838. Larry Dominguez, Box 27, Julian, Cal., for 1.875 c.f.s. from spring tributary to Carrizo Creek to be diverted in Sec. 24, T. 14 S., R. 7 E., S. B. B. and M., for irrigation and domestic purposes (80 acres). Estimated cost \$5,000.

Permits to Appropriate Water Issued by the Department of Public Works, Division of Water Resources, During the Month of November, 1930.

SAN BERNARDINO COUNTY.—Permit 3600. Application 6706. Geo. Thilth, Highland, Cal., November 3, 1930, for 0.003 c.f.s. from unnamed spring in Sec. 23, T. 2 N., R. 2 W., S. B., for domestic use. Estimated cost \$560.

EL DORADO COUNTY.—Permit 3601. Application 6761. John M. Ochsner, Sacramento, Cal., November 6, 1930, for 0.0003 c.f.s. from unnamed spring in Sec. 23, T. 11 N., R. 15 E., M. D., for domestic purposes. Estimated cost \$60.

LOS ANGELES COUNTY.—Permit 3602. Application 5555. John Kasper, Tat, Cal., November 6, 1930, for 25 c.f.s. from Fall Canyon in Sec. 13, T. 5 N., R. 15 W., S. B., for mining purposes. Estimated cost \$2,500.

SANTA CRUZ COUNTY.—Permit 3603. Application 5297. Felton Water Co., Felton, Cal., November 6, 1930, for 0.232 c.f.s. from Bennett Creek and Shingle Mill Creek in Sec. 21, T. 10 S., R. 2 W., M. D., for domestic purposes. Estimated cost \$5,000.

SANTA CRUZ COUNTY.—Permit 3604. Application 5298. Felton Water Co., Felton, Cal., November 6, 1930, for 0.232 c.f.s. from Bennett Creek and Shingle Creek in Sec. 21, T. 10 S., R. 2 W., M. D., for irrigation on 283.4 acres. Estimated cost \$5,000.

SANTA CRUZ COUNTY.—Permit 3605. Application 5299. Felton Water Co., Felton, Cal., November 6, 1930, for 0.232 c.f.s. from Bennett Creek and Shingle Mill Creek in Sec. 21, T. 10 S., R. 2 W., M. D., for municipal purposes. Estimated cost \$5,000.

SAN DIEGO COUNTY.—Permit 3606. Application 6360. Robert C. McCull, Imperial, Cal., November 7, 1930, for 2 c.f.s. from stream in Storm Canyon in Sec. 35, T. 14 S., R. 5 E., S. B., for irrigation and domestic uses on 120 acres. Estimated cost \$5,000.

ALAMEDA COUNTY.—Permit 3607. Application 6707. East Bay Municipal Utility District, Oakland, Cal., November 7, 1930, for 42 c.f.s. and 41,436 ac. ft. per annum from seven streams tributary to San Leandro Bay in Sec. 6, T. 2 S., R. 2 W., M. D., for municipal use. Estimated cost \$1,377,000.

SACRAMENTO COUNTY.—Permit 3608. Application 6758. A. L. White, Sacramento, Cal., November 7, 1930, for 1 c.f.s. from Sacramento River in Sec. 35,

T. 10 N., R. 3 E., M. D., for irrigation use on 50 acres. Estimated cost \$2,000.

SAN JOAQUIN COUNTY—Permit 3609, Application 6767. E. E. Hahn, Stockton, Cal., November 7, 1930, for 0.55 c.f.s. from French Camp Slough in Sec. 6, T. 1 S., R. 7 E., M. D., for irrigation use on 75.4 acres. Estimated cost \$3600.

SAN MATEO COUNTY—Permit 3610, Application 5670. Butano Land and Development Co., Los Altos, Cal., November 10, 1930, for 0.67 c.f.s. Butano Creek in Sec. 17, T. 8 S., R. 4 W., M. D., for domestic purposes. Estimated cost \$10,000.

SAN MATEO COUNTY—Permit 3611, Application 5671. Butano Land and Development Co. of Palo Alto, California, November 10, 1930, for 0.033 c.f.s. from 3 unnamed springs and an unnamed stream in Sec. 17, T. 8 S., R. 4 W., M. D., for domestic purposes. Estimated cost \$1,000.

SAN MATEO COUNTY—Permit 3612, Application 6121. Bertha A. Wildes, Piedmont, Cal., November 10, 1930, for 0.2 c.f.s. from 4 springs and Butano Creek in Secs. 19 and 20, T. 8 S., R. 4 W., M. D., for use for irrigation, domestic and maintenance of fish ponds on 200 acres.

PLUMAS COUNTY—Permit 3613, Application 6591. J. W. McKay and Merritt J. Reed, Meadow Valley, Cal., November 12, 1930, for 0.02 c.f.s. from Deadwood Creek in Sec. 28, T. 24 N., R. 8 E., for mining and domestic purposes. Estimated cost \$200.

SAN BERNARDINO COUNTY—Permit 3614, Application 6751. J. Richard Haas, Glendale, Cal., November 17, 1930, for 0.01 c.f.s. from an unnamed spring in Sec. 5, T. 2 N., R. 2 E., S. B., for domestic, stock and garden purposes. Estimated cost \$50.

SUTTER COUNTY—Permit 3615, Application 6486. Scott F. Ennis and Edward S. Brown, Sacramento, Calif., November 13, 1930, 60 c.f.s. from Sacramento River in Sec. 15, T. 14 N., R. 1 E., M. D., for irrigation use on 2432 acres. Estimated cost \$41,000.

RIVERSIDE COUNTY—Permit 3616, Application 6633. W. R. Peeler, Elsinore, Cal., November 20, 1930, for 0.0025 c.f.s. from a spring in Sec. 24, T. 6 S., R. 5 W., S. B., for domestic purposes. Estimated cost \$500.

LOS ANGELES COUNTY—Permit 3617, Application 4639. City of Arcadia, November 24, 1930, for 2 c.f.s. and 2500 ac. ft. per annum from Santa Anita Creek in Sec. 10, T. 1 N., R. 11 W., S. B. M., for municipal and domestic purposes. Estimated cost \$5,000.

LOS ANGELES COUNTY—Permit 3618, Application 4058. City of Sierra Madre, November 24, 1930, for 4 c.f.s. and 2000 ac. ft. per annum from Big Santa Anita Creek in Sec. 10, T. 1 N., R. 11 W., S. B., for domestic purposes. Estimated cost \$75,000.

LOS ANGELES COUNTY—Permit 3619, Application 2498. Security First National Bank of Los Angeles, Los Angeles, Cal., November 24, 1930, for 3000 ac. ft. per annum from Santa Anita Creek in Sec. 10, T. 1 N., R. 11 W., S. B., for domestic use. Estimated cost \$100,000.

LOS ANGELES COUNTY—Permit 3620, Application 5997. Security First National Bank of Los Angeles, Los Angeles, Cal., November 24, 1930, for 3000 ac. ft. per annum from Santa Anita Creek in Sec. 10, T. 1 N., R. 11 W., S. B. M., for domestic use. Estimated cost \$100,000.

SUTTER COUNTY—Permit 3621, Application 6726. B. P. Lilienthal, trustee, San Francisco, Cal., November 25, 1930, for 5 c.f.s. from Sacramento River in Sec. 11, T. 15 N., R. 1 W., M. D., for irrigation use on 200 acres. Estimated cost \$5,000.

MONTREY COUNTY—Permit 3622, Application 6718. El Sur Land and Cattle Co., Pebble Beach, Cal., November 25, 1930, for 12 c.f.s. from Big Sur River in Sec. 16, T. 19 S., R. 1 E., M. D., for irrigation use on 1024 acres. Estimated cost \$56,030.

RIVERSIDE COUNTY—Permit 3623, Application 1752. Temescal Water Co., Corona, Cal., November 29, 1930, for 12,000 ac. ft. per annum from San Jacinto River in Sec. 3, T. 4 N., R. 7 W., S. B. M., for irrigation of 5000 acres. Estimated cost \$100,000.

RIVERSIDE COUNTY—Permit 3624, Application 2341. Lake Hemet Water Co., Hemet, California, November 29, 1930, 18,000 ac. ft. per annum from Strawberry Creek, Dry Creek and Harthorn Creek in Secs. 23, 25 and 26, T. 5 S., R. 2 W., S. B., for irrigation and domestic use on 12,508.64 acres. Estimated cost \$665,000.

"Ma, is it right to say that you 'water a horse' when you give him a drink?"

"Yes, son."

"Well, then, I'm going to milk the cat."

DAM APPLICATIONS

AND APPROVALS

Applications for Approval of Dams Built Prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, During the Month of November, 1930.

SIERRA COUNTY—Packer Lake Dam No. 294-6. E. A. and J. O. Hayes, San Jose, owners; rock and earth, 7.7 feet above streambed with a storage capacity of 70 acre-feet, situated on Packer Creek tributary to North Fork Yuba River in Sec. 5, T. 20 N., R. 12 E., M. D. B. and M., for storage purposes for power use.

SIERRA COUNTY—Deer Lake Dam No. 294-7. E. A. and J. O. Hayes, San Jose, owners; earthfill, with a storage capacity of 70 acre-feet, situated on tributary of Salmon Creek tributary to Yuba River in Sec. 31, T. 21 N., R. 12 E., M. D. B. and M., for storage purposes for power use.

SHASTA COUNTY—Hat Creek No. 1 Diversion Dam No. 97-97. Mt. Shasta Power Corp., San Francisco, owner; rock crib, 63 feet above streambed, situated on Hat Creek tributary to Pit River in Sec. 5, T. 35 N., R. 4 E., M. D. B. and M.

TUOLUMNE COUNTY—Big Dam No. 97-102. Sierra and San Francisco Power Co., San Francisco, owner; crib dam, 35 feet above streambed with a storage capacity of 1890 acre-feet, situated on South Fork Stanislaus River tributary to Stanislaus River in Sec. 9, T. 4 N., R. 9 E., M. D. B. and M.

TRINITY COUNTY—Lower Stuarts Fork Dam No. 212. La Grange Placers, Inc., Los Angeles, owner; rock fill, 15 feet above streambed, situated on Stuarts Fork Creek tributary to Trinity River in Sec. 3, T. 36 N., R. 10 W., M. D. B. and M., for storage purposes for mining use.

SAN MATEO COUNTY—Fleishacker Dam No. 609. Mortimer Fleishacker, Woodside, owner; earth fill, 39 feet above streambed with a storage capacity of 1175 acre-feet, situated on unnamed creek tributary to San Gregorio Creek.

PLUMAS COUNTY—Taylor Lake Dam No. 288. J. L. and Elizabeth Robinson, Reno, Nevada, owners; rock and earth dam, 10 feet above streambed with a storage capacity of 200 acre-feet, situated on Hungry Creek tributary to Indian Creek in Sec. 35, T. 27 N., R. 1 E., M. D. B. and M., for storage purposes for irrigation use.

TEHAMA COUNTY—Stewart Dam No. 262. Jesse I. Selvester, Cottonwood, owner; earth dam, 11 feet above streambed with a storage capacity of 10 acre-feet, situated on drainage tributary to Cottonwood Creek.

MODOC COUNTY—Ralston Dam No. 151-2. James M. Fitzhugh, Alturas, owner; timber dam, 5 feet above streambed with a storage capacity of 50 acre-feet, situated on Pit River tributary to Sacramento River in Sec. 3, T. 41 N., R. 10 E., M. D. B. and M., for diversion purposes for irrigation use.

MONO COUNTY—Dexter Creek Dam No. 532. Wm. Symons, Hammil, owner; earth dam, 181 feet above streambed with a storage capacity of 536.68 acre-feet, situated on Dexter Creek tributary to Adobe Creek in Sec. 12, T. 1 S., R. 29 E., M. D. B. and M., for diversion purposes for irrigation use.

Applications for Approval of Plans and Specifications for Construction or Enlargement of Dams filed with the State Department of Public Works, Division of Water Resources, during the Month of November, 1930.

CONTRA COSTA COUNTY—Port Costa Reservoir No. 581-2. California Water Service Company, San Francisco, owner; earth dam, 39 feet above streambed with a storage capacity of 41.7 acre-feet, located in Sec. 3, T. 2 N., R. 3 W., M. D. B. and M., for storage purposes for domestic and industrial use. Estimated cost of enlargement \$5,434. Fees paid \$54.34.

Applications for Approval of Plans and Specifications for Repair or Alteration of Dams Filed with the State Department of Public Works, Division of Water Resources, During the Month of November, 1930.

CONTRA COSTA COUNTY—Port Costa Dam No. 581-2. California Water Service Company, San Francisco, owner; earth dam, 39 feet above streambed with a storage capacity of 41.7 acre-feet, located in Sec. 3, T. 2 N., R. 3 W., M. D. B. and M., for storage purposes for domestic and industrial use. Estimated cost of enlargement \$5,434. Fees paid \$54.34.

cisco, owner; earth dam, located in Sec. 3, T. 2 N., R. 3 W., M. D. B. and M.

CONTRA COSTA COUNTY—Cheney Dam No. 581. California Water Service Company, San Francisco, owner; earth fill dam, located in Sec. 13, T. 2 N., R. 2 W., M. D. B. and M.

MODOC COUNTY—Bayley Dam No. 128-3. Modoc Feeding Company, Likely, owner; earth dam, situated on Crooks Canyon tributary to South Fork Pitt River in Sec. 32, T. 40 N., R. 12 E., M. D. B. and M.

SIERRA COUNTY—Lower Fairplay Dam No. 296-4. W. P. Stiles, Shreveport, Louisiana, owner; earth dam, situated in T. 20 N., R. 9 E., M. D. B. and M.

SAN BERNARDINO COUNTY—Running Springs Dam No. 806. Running Springs Park, Inc., Los Angeles, owner; earth dam, situated on tributary to Deep Creek.

SAN BERNARDINO COUNTY—Chino Ranch No. 1, No. 801. Wm. Rowland Estate, Scott Investment Co. and Chandis Sec. Co., Los Angeles, owners; earth fill, situated on Branch of Brea Canyon in Sec. 13, T. 2 S., R. 9 W., S. B. B. and M.

SACRAMENTO AND PLACER COUNTIES—Baldwin Reservoir A and B, No. 324-2. North Fork Ditch Company, San Francisco, owner; earth fill, situated on unnamed creek tributary to Linda Creek in Sec. 14, T. 10 N., R. 7 E., M. D. B. and M.

LASSEN COUNTY—Lexalt Dam No. 248. Peter Lexalt, Madeline, owner; earth dam, situated on McDonald Creek tributary to Madeline Plains in Sec. 2, T. 36 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—White Reservoir No. 151. James M. Fitzhugh, Alturas, owner; earth dam, situated on unnamed gulch tributary to Pitt River in Sec. 26, T. 41 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Courtwright Dam No. 155. R. Anchordoguy, Red Bluff, owner; earth dam, situated on Happy Camp Creek in Sec. 15, T. 42 N., R. 7 E., M. D. B. and M.

SAN BERNARDINO COUNTY—Chino Ranch No. 2, No. 801-2. W. Astley, Los Angeles, owner; earth dam, situated on Branch of Brea Canyon in Sec. 13, T. 2 S., R. 9 W., S. B. B. and M.

SAN BERNARDINO COUNTY—Chino Ranch No. 3, No. 801-3. W. Astley, Los Angeles, owner; arch dam, situated on Branch of Brea Canyon, located in Sec. 13, T. 2 S., R. 9 W., S. B. B. and M.

CONTRA COSTA COUNTY—Port Costa Brick Works Dam No. 585. Port Costa Brick Works, Port Costa, owner; earth dam situated on a ravine.

SAN BERNARDINO COUNTY—Los Cerranos Dam No. 808. Davidson Investment Company, Long Beach, owner; earth dam.

RIVERSIDE COUNTY—Alvord (Sanborn) Dam No. 815. Riverside Water Company, Riverside, owner; earth fill dam, located in S², Sec. 23, T. 3 S., R. 6 W., S. B. B. and M.

RIVERSIDE COUNTY—Mocking Bird Canyon Dam No. 814. Gage Canal Company, Riverside, owner; situated in Mocking Bird Canyon in Sec. 20, T. 3 S., R. 5 W., S. B. B. and M.

PLANS APPROVED

Plans and Specifications for the Construction or Enlargement of Dams Approved by the State Department of Public Works, Division of Water Resources, During the Month of November, 1930.

STANISLAUS COUNTY—La Grange Dam No. 68-2. Turlock and Modesto Irrigation Districts, Turlock and Modesto, owners; gravity arch dam, situated on Tuolumne River tributary to San Joaquin River in Sec. 16, T. 3 S., R. 14 E., M. D. B. and M.

ORANGE COUNTY—Peters Canyon Dam No. 793-2. The Irvine Company, Tustin, owner; earth dam, 41 feet above streambed with a storage capacity of 1090 acre-feet, situated on Veters Canyon located in Block 16, Irvine's Subdivision, for storage purposes for irrigation use.

Plans for the Repair or Alteration of Dams Approved by the State Department of Public Works, Division of Water Resources, During the Month of November, 1930.

MODOC COUNTY—Payne Dam No. 143. H. G. and R. A. Payne and G. P. French, Alturas, owners; earth dam, situated on unnamed drainage tributary to South Fork Pitt River in Sec. 15, T. 41 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Sawmill Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; rock dam, situated on Canyon Creek tributary to South Yuba River in Sec. 11, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earth dam, situated on South Fork Canyon Creek, tributary to South Yuba River in Sec. 23, T. 18 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Little Juniper Dam No. 136. G. M. and J. E. Clark, Alturas, owners; earth dam, situated on Little Juniper Creek tributary to Pitt River in Sec. 4, T. 40 N., R. 12 E., M. D. B. and M.

MODOC COUNTY—James Porter Dam No. 142. James C. and Phear F. Porter, Alturas, owners; earth dam, situated on unnamed drainage tributary to Parker Creek, located in Sec. 1, T. 42 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—James Flat Dam No. 121. W. O. Blasingame and Fred Huffman, Alturas, owners; earth dam, situated on Mosquito Creek tributary to Willow Creek in Sec. 25, T. 47 N., R. 16 E., M. D. B. and M.

MODOC COUNTY—Antelope Dam No. 121-3. W. O. Blasingame and Fred Huffman, Alturas, owners; earth dam, situated on Antelope Plains tributary to Pitt River in Sec. 11, T. 43 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Esse Dam No. 121-2. S. N. Ranch, Alturas, owner; earth dam, situated on Salsbury Creek tributary to Pitt River in Sec. 6, T. 42 N., R. 11 E., M. D. B. and M.

MARIPOSA COUNTY—Mountain King Dam No. 95-11. San Joaquin Light and Power Corp., Fresno, owner; gravity dam, situated on Merced River tributary to San Joaquin River in Sec. 1, T. 4 S., R. 17 E., M. D. B. and M.

LOS ANGELES COUNTY—Mulholland Dam No. 67. City of Los Angeles, Los Angeles, owner; gravity dam, situated on Weid Canyon in Sec. 3, T. 1 S., R. 14 W., S. B. B. and M.

NEVADA COUNTY—Van Geisen Dam No. 61-9. Nevada Irrigation District, Grass Valley, owner; situated on Bear River tributary to Yuba River in Sec. 2, T. 13 N., R. 8 E., M. D. B. and M.

SANTA CLARA COUNTY—Lake Ranch Dam No. 622. San Jose Water Works, San Jose, owner; earth dam, situated on Beardsley Creek tributary to Los Gatos Creek in Sec. 23, T. 8 S., R. 2 W., M. D. B. and M.

MODOC COUNTY—Bayley Dam No. 128-3. Modoc Feeding Company, Likely, owner; earth dam, situated on Crooks Canyon tributary to South Fork Pitt River in Sec. 32, T. 40 N., R. 12 E., M. D. B. and M.

SACRAMENTO AND PLACER COUNTIES—Baldwin Dam No. 324-2. North Fork Ditch Company, Sacramento, owner; earth dam, situated on unnamed creek tributary to Linda Creek in Sec. 14, T. 10 N., R. 7 E., M. D. B. and M.

SONOMA COUNTY—Lawler Reservoir No. 581-3. California Water Service Company, San Francisco, owner; earth dam, situated on North Creek tributary to Adobe Creek in Sec. 12, T. 5 N., R. 7 W., M. D. B. and M.

LASSEN COUNTY—Lake Leavitt Dam No. 236-2. Lassen Irrigation District, Standish, owner; earth dam located in Sec. 15, T. 24 N., R. 13 E., M. D. B. and M.

SAN BERNARDINO COUNTY—Running Springs Park Dam No. 806. Running Springs Park, Inc., Los Angeles, owner; earth dam, situated on tributary to Deep Creek.

MODOC COUNTY—White Dam No. 151. James M. Fitzhugh, Alturas, owner; earth dam, situated on unnamed gulch tributary to Pitt River in Sec. 26, T. 41 N., R. 10 E., M. D. B. and M.

LASSEN COUNTY—Lexalt Dam No. 248. Peter Lexalt, Madeline, owner; earth dam situated on McDonald Creek tributary to Madeline Plains in Sec. 2, T. 36 N., R. 13 E., M. D. B. and M.

SANTA CLARA COUNTY—Upper Howell Dam No. 622-3. San Jose Water Works, San Jose, owner; earth dam, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

CONTRA COSTA COUNTY—Port Costa Brick Works Dam No. 585. Port Costa Brick Works, Port Costa, owner; earth dam situated on a ravine.

Green is not used in the color scheme of automobiles in Persia and Asia, as it is considered sacred and in Japan is reserved for members of the imperial family.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

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B. B. MEEK-----Director

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E. R. HIGGINS, Chief Accountant

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CHARLES H. WHITMORE, District III, Sacramento

J. H. SKEGGS, District IV, San Francisco

L. H. GIBSON, District V, San Luis Obispo

E. E. WALLACE, District VI, Fresno

S. V. CORTELYOU, District VII, Los Angeles

E. Q. SULLIVAN, District VIII, San Bernardino

F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

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Eleventh and P Streets, Sacramento, California

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R. L. JONES, Deputy in Charge Flood Control and Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams

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GORDON ZANDER, Adjudication, Water Distribution

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W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

W. M. CALLAHAN, Electrical Engineer

DIVISION OF MOTOR VEHICLES

FRANK G. SNOOK, Chief

EUGENE W. BISCAILUZ, Superintendent of California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor

Port of San Jose—Not appointed

Port of San Diego—Edgar A. Luce

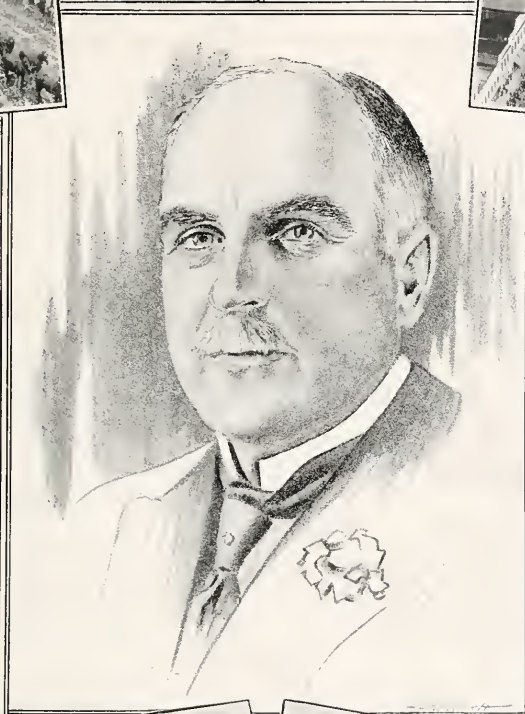
STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



Let us have faith in California!... Let us display at the opening of this new year the courage and confidence which inspired the pioneers; which have characterized Californians from the earliest days and without which there is little in life worth having
--GOVERNOR JAMES ROLPH, JR.



We can shape our own future. Let us do so. And let us begin today by resolving to open a new administration with a revived and strengthened faith in California.
--GOVERNOR JAMES ROLPH, JR.

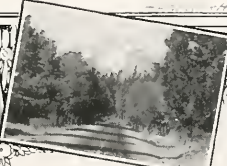
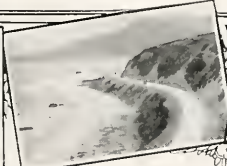
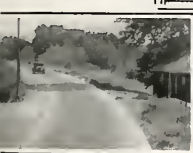


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My Highway Creed

By JAMES ROLPH, JR., Governor of California

I AM INTENSELY interested in the highways of California, for it is over these highways that the life of the state is flowing.

Some think of highways in terms of traffic only; others in terms of engineering and materials; still others in terms of mileage and location. I do not minimize the importance of any of these factors. But I like to think of our highways in California as alive and vital. I like to consider them in terms of human values.

Over these highways that we have built and are building, the thoughts, the ideas, and the ideals of a whole people are flowing.

Over these highways the great traditions of our great state are flowing.

Over these highways the civilization of the past is merging into the civilization of the present, and the civilization of the present is flowing into that of the future.

The highways of California are also making every part of California the common possession of every other part.

The people of the North have the common right to enjoy with the people of the South the entrancing beaches, the spectacular deserts, the amazing cities and the wonderful communities that have made the Southland envied around the world.

And the people of the South have also the right to enjoy with the North the glory of the Redwoods, the majesty of the Sierras, and the lure and romance that have made our northern cities loved around the world.

By reason of our highways the coast belongs to the valley, and the valley to the coast.

Yosemite, Lassen, Tahoe, Shasta—all these and countless other attractions have been written into the lives of our people by reason of our highways.

Our highways are also doing an even greater work. They are acquainting our people with each other.

Lack of acquaintanceship begets sectionalism, and sectionalism begets suspicion.

Neighborliness on the other hand is the hand servant of trust, confidence and friendship.

Our highways are making the people of California neighborly, and in that they are dealing a deathblow to the spirit of selfish sectionalism.

The California state highway system has been well started. Our task is its early completion. And in doing this we should keep in mind a few simple, yet important standards to guide our endeavor and to measure our success.

The roads of California must be so built that they both are adequate for traffic needs, and that they also invite and encourage the free flow of travel from every part of the state to every other part.

The highways of California must be made as safe for travel as it is humanly possible so to do.

The highways of California, through beautification and adornment, must be made pleasant and attractive to travel.

If we build highways in this way, we can know that the lives of the people of California will be enriched many times over the cost of the highways to us.

And it is my firm determination so to build.

ROLPH INAUGURALISMS

The greatest business of the State is the business of Government.

Government should be conducted on lines of economy, but not on a basis of parsimony.

Let us face 1931 with heads up and shoulders back, looking forward with serene confidence in the destiny of our State.

I wish to imbue the people of California with my own faith in California.

All California needs right now to bring about recovery is a spirit of confidence and quick response to courageous leadership; the state of mind which says, "I will," instead of "I can not."

Build Together for California

By COLONEL WALTER E. GARRISON, Director of the Department of Public Works

THE Department of Public Works is so integrally connected with the development of California, and the growth and prosperity of its every part, that I feel a heavy sense of responsibility not only to the state but to every county and community in it, as I assume the duties of Director of the Department.

The reason for this will be apparent to all when it is remembered that the Department of Public Works deals directly with the construction, maintenance and operation of California's state highways, its water resources, and both the planning and building of its state institutions.

The completion of our highway system, the workmanlike construction of roads, and their proper location require the most careful thought, the exercise of sound business judgment, and absolute fairness to every section of California.

The growth of California depends in large measure upon the solution of the difficult water problems that confront the state.

One test of the humanity of California is the manner in which it cares for the wards of the state. Our state institutions must be planned and built to meet this test.

But the major phases of these problems have been stated. Each major problem involves a multitude of minor problems. Responsibility for their proper solution lies largely with the Department of Public Works.

If we look only at the problems, the task that confronts the Department would indeed be discouraging. Fortunately there is another side to the picture.

The history of California is written in terms of difficulties surmounted, of obstacles

overcome, of problems, apparently unsolvable, successfully solved.

The greatest legacy of the pioneer days to California is the genius of its people for accomplishing the seemingly impossible, and of achieving the seemingly unachievable.

This heritage still remains with our people. We largely pioneered the construction of improved highways in the nation. We have done much pioneering in our water development. The same ability of our people to solve highway and water problems in the past, will enable us to solve these problems in the future.

My own work is first to gather information and to collect, assemble and analyze facts. With these facts as a foundation, policies and programs for constructive action can then be formulated.

California is a large state. The highway problems of the whole

world are found in its mountains and deserts, in its valleys and along its coasts. The water problems of the world are also found here, with a few peculiarly our own thrown in for good measure.

The solution of these problems is too large a task for any one man. It is too large a task for any staff of experts, however skilled such staff may be. It requires the collective wisdom and the constructive thought of the people of the whole state.

It is this assistance that I want, and I know that Governor Rolph wants the same.

During the coming four years it is my hope that the Department of Public Works will be the clearing house for highway, water and institutional information from every community in California. I want also to be

COLONEL WALTER E. GARRISON

Appointed by Governor Rolph as Director of the Department of Public Works, brings to the department a long experience in matters with which the department is chiefly concerned. As one of the most extensive vineyardists in California, Colonel Garrison knows the water problems of this state from the point of view both of a practical irrigationist, and of one who has been active in the development of water for irrigation. In highway matters Colonel Garrison has been a prominent proponent of the cause of good roads since the earliest state highway days. He has been particularly active in the development of improved highways in Stanislaus and San Joaquin counties, where he has made his home since his birth.

Colonel Garrison has had extensive business experience both in growing grapes and in their marketing. His vineyards are in the Lodi district.

Colonel Garrison also brings to the administration a distinguished war record. He served with honor in the Philippines during the Spanish-American War. He was wounded twice in action in the World War, and his valor on the field of battle won for him an award from the French Government of the greatly coveted Croix de Guerre. He is now an active officer with the 181st Brigade, attached to the 91st Division.



COLONEL WALTER E. GARRISON

told the hopes and the ambitions of these communities for their own growth and development. By such cooperation in constructive endeavor, these four years can be made

outstanding in California as a period of sound and prosperous expansion, and as an era of comfort, contentment and well-being on the part of its people.

The Task Before The California Highway Commission

By EARL LEE KELLY, Chairman of the California Highway Commission.

THE state highways of California have contributed so largely to making California what it is today that it is, indeed, a great privilege to be assigned an active part in building and maintaining these roads.

I know that I speak for all the members of the California Highway Commission when I say that we are determined that the period for which Governor Rolph has entrusted us with responsibility in state highway matters shall be years of active development.

It is, of course, impossible for newly appointed members of a commission to speak in anything but general terms of either state highway policies or state highway plans. This becomes very apparent when it is realized that state highway activities on the one hand are as far reaching as California itself, and, on the other hand are so detailed that they cover by minute specifications and order every foot of highway in the state system.

There are some general features of the work, however, that have impressed themselves on me.

There is a need for a balanced development of our highway program. The roads in the rural sections of the state must be developed both to take care of their own traffic needs, and also to provide transportation facilities in and out of the metropolitan centers. Governor Rolph expressed this thought in his very able inaugural address.

California is rapidly becoming the playground for the nation and the development of recreational highways is, therefore, a matter in which the whole state has a very direct financial and social interest. Accordingly, the measure of support given these roads cannot be judged by census figures of population living along them, but must be determined by the recreational service to the whole state that their improvement will make possible.

Commercial highways in California must be both located and designed to enable both present traffic to be served and future traffic to be cared for without undue and unnecessary cost in expansion of highway expenditures.

We must be ever watchful that the revenues of the California highway system be protected against diversion to other than highway uses. Fairness to motorists, who are paying the highway bill, requires this. Fair-



Earl Lee Kelly

ness to the highway system makes the same demand. Unless these revenues are so protected, the completion of our state system will be delayed for many years to the consequent injury of the whole state.

In a period of unemployment such as we are having at the present time, it is the duty of those in charge of public works through an expansion of their program, to point out the path to private industry and to lead the way to a larger volume of employment, with its resultant relief of both public and personal distress.

These are some of the tasks to which the California Highway Commission has committed itself.

I desire to say that our every effort will be exerted to reflect credit upon our new Governor and to assist him in making the next four years outstanding in the history of California—an era of friendly, sound and economical businesslike administration.

(Continued on page 5.)

The New State Highway Commission

Chairman of Highway Board Well Versed In Road Matters

Earl Lee Kelly, chairman of the California Highway Commission, lives in Redding, where he is president and general manager of the Shasta County Title Company. He spent his boyhood days in Humboldt County, graduating from the Eureka High School. He is a graduate of the law department of the University of California with the class of 1915.

After returning from service in the World War, Mr. Kelly engaged in the title and insurance business in Redding, making an outstanding success of this business.

Mr. Kelly has served Redding both on the City Council and as Mayor of the city. He has also been prominent in state political affairs, and is an active member of the Republican State Central Committee.

During his life-long residence in Northern California, Mr. Kelly has become exceptionally well versed in state highway problems and policies, especially as they affect the northwestern coastal counties and the valley and mountain counties of northeastern California. He brings to these problems a seasoned and successful business judgment, gained both in the conduct of his own business, and in the course of his official service as Mayor and City Councilman of Redding.

THE TASK BEFORE THE CALIFORNIA HIGHWAY COMMISSION

(Continued from page 4.)

Therefore, on behalf of the California Highway Commission, I ask that cooperation in state highway matters so aptly described by Governor Rolph in his inaugural address as

"a disposition among all of our people to bear with one another in the differences which naturally exist among us in order that we may all cooperate in the many matters in which we are or should be in full accord. If we take counsel among ourselves in a spirit of true charity we are certain to be an harmonious and happy people."

Banker: I suppose that is the hired man."

Farmer: "No, that's the fourth Vice President in charge of Cows."

Road Interests of Central State are In Expert Hands

Harry A. Hopkins, selected by Governor Rolph as a member of the California Highway Commission, has long been a prominent figure in the development of the San Joaquin Valley.



Harry A. Hopkins

His home for the past twenty-seven years has been in Kern County, and for twenty-one years in Taft. Mr. Hopkins served as the first postmaster of Taft, he naming the city after President Taft. He served this city as its mayor from 1912 to 1914, and as councilman for eight years, and since retiring from public office to private business as manager of the Taft Ice Company, he has worked unceasingly in public affairs. His interest in these matters has included not only Taft and

Kern County, but the state as a whole, and has covered a wide range from civic promotion and betterment activities to service in patriotic organizations, particularly the Red Cross.

Mr. Hopkins brings to the new work to which he has been appointed a successful experience both in private and public business affairs. He also brings an exceptionally intimate knowledge of the highway needs both of the San Joaquin Valley and the central portion of the state generally.

Timothy A. Reardon Is Heir to Pioneer Qualities of Parents

Few men in California have had greater experience in the conduct of public work than Timothy A. Reardon, appointed by Governor Rolph as a member of the California Highway Commission from San Francisco.

Mr. Reardon was born of pioneer parents, his father coming to California in 1850 and his mother in 1852. The qualities of unflinching courage, shrewd intelligence and unbounding energy, characteristic of the pioneers, were the invaluable legacy that these pioneer parents left to their children. Beginning his life as a mechanic apprentice, these qualities enabled Mr. Reardon to fight his way to the presidency of the powerful and important Board of Public Works of San Francisco. These same qualities lead Governor Rolph to name Mr. Reardon as a member of the California Highway Commission.

As president of the Board of Public Works, and appointed to that position when Governor Rolph was first selected Mayor of San Francisco, Mr. Reardon has been in active charge under Mr. Rolph of the rebuilding of San Francisco. Under his administration as President of the Board of Public Works, over \$411,000,000 has been expended. The operations of the Board of Public Works, which include operating as well as construction activities, involve annual expenditures approximating \$30,000,000.

Before his appointment to the presidency of the Board of Public Works of San Francisco, Mr. Reardon served that city as Superintendent of Public Works. It was the service performed in that capacity that lead to his promotion to the presidency of the board having public works in charge.

Mr. Reardon's appointment to the California Highway Commission makes the vast



Timothy A. Reardon

fund of knowledge and experience he has gained in over twenty years of active control of San Francisco's building and operating program available to the whole State of California. This appointment came as a complete surprise to him. He was in Sacramento congratulating Governor Rolph upon the latter's active assumption of the duties of chief executive. Mr. Reardon was about to leave for home when the appointment was made. As he stepped up to shake hands with Mr. Rolph, the Governor placed the commission in his hands.

New Commissioner Has Had Big Part in Building Southland

FRANK A. Tetley of Riverside, appointed by Governor Rolph to the California Highway Commission, is outstanding in the development of southern California. Born in Moscow, Russia, of English parentage, he came to the United States when three years of age. He celebrated his coming to majority by immediately moving to California, locating in Riverside.

In Riverside Mr. Tetley found his first employment with Frank A. Miller of the Mission

Philip A. Stanton has Long and Distinguished Record of Achievement

Philip A. Stanton of Anaheim, appointed by Governor Rolph as a member of the California Highway Commission, has won, through public service and personal achievement, the distinguished honor of a place in "Who's Who in America." Born in Ohio, Mr. Stanton came to California in 1887, then a youth of nineteen years. Three towns in southern California, Huntington Beach, Seal Beach and Stanton, were founded through his vision and constructive genius.

Mr. Stanton is president of four important water and land companies. In addition to



Frank A. Tetley

Inn. Later he entered the real estate and insurance business.

Believing in the California citrus industry, Mr. Tetley started in 1900 in the citrus nursery business. He has continued in this business for over 30 years. During this time he has produced and sold over 1,000,000 trees, and has improved and reclaimed over 1250 acres of land by installing wells and pumping plants.

Mr. Tetley has been in the banking business for thirty years and is at present a director in the Citizens National Trust & Savings Bank of Riverside, vice president of the Security Savings Bank of Riverside and a director in the Citizens Bank of Arlington, California. He served for several years on the Board of Public Utilities of Riverside.



Philip A. Stanton

"Lapland is the most thinly populated country in the world," says a contemporary. It doesn't say how many Lapps there are to the mile.—*The Passing Show*.

Single Gent: "What's the best month to get married in?"

Married Person: "Octemburary."

Single Gent: "Why, there's no such month."

Married Person: "Just so."

this he qualifies as an 'honest to God' farmer, as the greater part of his time is now spent on and in the active management of his 250-acre ranch at Stanton, which is largely planted to oranges and walnuts.

(Continued on page 12.)

State Highway Budget For 1931-1933 Biennium Presented to State Legislature

THE biennial state highway budget recommending expenditures of \$63,322,500 upon the state highway system for the ensuing two fiscal years was presented to the State Legislature on Monday, January 12th, by Governor Rolph.

The budget covers contemplated expenditures for all state highway purposes including construction, reconstruction, maintenance, purchase of rights of way, engineering and administrative costs. The distribution of the money between northern and southern counties, and between primary and secondary highways is in accordance with the provisions of the Breed Bill.

While the budget is for the fiscal years of July 1, 1931, to June 30, 1933, if previous rulings are followed, the funds provided in the budget will be available for expenditure upon adoption by the Legislature and approval by the Governor. This will enable state highway work to proceed without interruption, a course greatly desired by Governor Rolph and Colonel Garrison, director of the Department of Public Works.

Construction and reconstruction projects included in the budget, as submitted to the Legislature by Governor Rolph are as follows:

REDWOOD HIGHWAY

(San Francisco to Oregon Line Near Monumental)

Grading, structures, 17.3 miles, Cloverdale to Hopland (Mendocino and Sonoma counties), \$900,000. Beginning of construction on new line along the Russian River between Cloverdale and Hopland which will eliminate the present steep and crooked existing road. This section was never undertaken before through fear of slide conditions. The design of the road to be built there provides for these conditions, shortens the distance over $1\frac{1}{2}$ miles, substitutes a light water grade for a long mileage of steep maximum grades.

Grading, structures, armor rock surfacing, 1.4 miles, Little Dam Creek to Leggett (Mendocino County), \$85,000.

Cedar Creek and Dann Creek (Mendocino County), 2 bridges, concrete and steel, \$284,000.

Crescent City to Elk Valley (Del Norte County), 5.3 miles, grading, structures, oil rock surfacing, \$249,000. This completes the present Redwood Highway gap in Del Norte County and locates the road via Crescent City, settling a long existing controversy.

Dyersville bridge and approaches (Humboldt County), \$196,400.

Bridge and approaches over east branch of Eel River at Ben Bow (Humboldt County), \$111,000.

Grading and trestle approaches, Robinson Ferry bridge (Humboldt County), \$51,400.

Slope protection, Hiouchi Bridge to north boundary of Del Norte County, \$50,000.

Grading, structures and armor rock surface, 5.5 miles, Pepperwood School to Farm House Inn (Mendocino County), \$561,000. This provides for the reconstruction of the present narrow, steep and tortuous Rattlesnake Grade in Mendocino County.

Grading and macadam shoulders 11.3 miles, South Scotia bridge to Fortuna (Humboldt County), \$135,600. The present 15-foot pavement will be widened and made safer for the increased traffic using this section of the road.

Grading and oil surfacing, Arnold to Pepperwood School, portions (Mendocino County), \$85,000.

Oil surfacing, Loleta to 2 miles north of Beatrice, 5.3 miles (Humboldt County), \$60,000.

PACIFIC HIGHWAY

(Section from Red Bluff to Oregon Line)

Bridge at Clear Creek (Shasta County), \$57,800.

Bridge at Cottonwood Creek (Siskiyou County), \$18,500.

Oiling surface, 7 miles, 1.3 miles north of Yreka to Klamath River (Siskiyou County), \$22,400.

Grading, oil surfacing, Cottonwood Creek bridge, approaches (Siskiyou County), \$27,600.

PACIFIC HIGHWAY

(East Side—Sacramento to Tehama Junction via Marysville)

Grading and shoulders, 6.3 miles, Shasta Union School to 6 miles north (Butte County), \$28,350.

Grading and pavement, 8.4 miles, Lincoln to Sheridan and Wheatland to Dry Creek (Placer and Yuba counties), \$63,000.

Bridge at Coon Creek (Placer County), \$27,500.

PACIFIC HIGHWAY

(West Side—Tehama Junction to Benicia)

Grading, structures, paving 0.5 of a mile in Wilks (Glenn County), \$25,000.

Oil rock surfacing, 8.9 miles, Williams to Maxwell (Colusa County), \$100,000.

Grading, gravel base and small structures, 4 miles, Williams to 4 miles south (Colusa County), \$80,000.

All three of these projects constitute the progressive improvement of the West Side Highway.

GOLDEN STATE HIGHWAY

(Valley Route—Sacramento to Los Angeles)

Merced River Bridge and approaches (Merced County), \$275,000.

Berenda Slough Bridge (Madera County), \$38,000.

Grading structures and pavement, 0.7 of a mile, Madera city limits northerly, \$40,500.

Bridge over Fresno River (Madera County), \$60,000.

(Continued on page 33.)

James I. Herz, Newly Named Deputy Director Knows His California

James I. Herz, newly appointed Deputy Director of the Department of Public Works, brings to the work a background of experience in administrative and financial affairs and a knowledge of California that will prove



James I. Herz

of great value to the department. He was born in San Francisco, has lived all his life in California, and has at one time or another visited every county in the state. Accordingly he knows his California.

His administrative experience was gained as a member of the San Francisco Board of Supervisors. As deputy director he will have largely to do with the finance of the department. To this he brings a knowledge of financing methods gained in the stock and bond business, and supplemented by legal training.

Mr. Herz is thirty-five years old and is a graduate of the University of California and of Hastings College of the Law. He is a veteran of the World War, and is president of

TRAFFIC OFFICERS ARE GIVEN PRAISE FOR INAUGURAL ASSISTANCE

CITY OF SACRAMENTO
STATE OF CALIFORNIA

January 8, 1931

Motor Vehicle Department,
Sacramento, California.
Gentlemen:

I desire to thank you for your cooperation during the Rolph Inaugural in Sacramento on January 6 and 7.

Please convey to the men who were detailed to assist this Department our sincere thanks. Their work was well done, and many favorable comments were received.

It is only through cooperation such as we received that big affairs of this nature can be properly handled and in closing I wish to again thank you for your assistance.

Very truly yours,

(Signed) W. M. Hallanan,
Chief of Police.

Editorial Lauds Purcell's Retention as Highway Engineer

The fact that C. H. Purcell will remain as State Highway Engineer has been the subject of many congratulatory editorials in the press throughout the state.

The following excerpt from the San Francisco Chronicle, published prior to the inauguration of Governor Rolph, indicates the tenor of many of these editorials.

Mayor Rolph is to be congratulated on his statement that as Governor he will reappoint State Engineer Purcell. This official has given excellent service in the many and highly technical duties of the place, particularly in connection with the San Francisco Bay bridge project. His value to the state has been vastly enhanced by his intimate experience with the fine points of that very delicate matter. If for no other reason than his value to the bay bridge project it would be nothing short of a calamity for the state to lose Engineer Purcell's services at this critical juncture.

State-wide realization of Mr. Purcell's peculiar fitness for the problems at hand brought the importance of retaining him to Mr. Rolph's attention. The Mayor was quick to see the merit of the case and to declare his intentions.

the 91st Division Association and past vice commander of the American Legion.

In addition to electing him a member of the Board of Supervisors, San Francisco has further honored Mr. Herz by selecting him as a member of the War Memorial trustees.

Employment Measures Signed



Governor Rolph signs building employment bill; seated, left to right, Edgar C. Levey, Speaker of the Assembly; Arthur H. Breed, President pro tem of the Senate; Lieutenant Governor Frank C. Merriam; Governor James Rolph, Jr. Standing, left to right, James I. Herz, Deputy Director of the Department of Public Works; Dr. J. M. Foner, Director of the Department of Institutions; Colonel Carlos Huntington, Director of the Department of Professional and Vocational Standards; Assemblyman Robert L. Patterson; Assemblyman Harry F. Sewell, Harold E. Smith, Superintendent of Accounts, Department of Finance; State Architect George B. McDougall, Colonel Walter E. Garrison, Director of the Department of Public Works; C. H. Purcell, State Highway Engineer; Rolland A. Vandegrift, Director of the Department of Finance.

A total of \$10,000,000 in state institution and state highway construction will be under way in California within the next ninety days, Colonel Walter E. Garrison, director of the Department of Public Works, has announced.

Colonel Garrison's statement was made as Governor Rolph signed the bill appropriating \$5,109,600 for state institutional construction. The director lauded the action of the chief executive in signing this bill as an emergency measure. He assured Governor Rolph that the money thus provided would find its way into the hands of labor and trade under orders of full speed ahead.

RED TAPE SLASHED

A new record is being established in placing this program under construction, Colonel Garrison further stated. Red tape has been

ruthlessly slashed in order that the work provided through Governor Rolph's signature to the appropriation bill may be made immediately available to the people of California.

Instanting the manner in which this program is being speeded up, the director stated that the suggestion of Governor Rolph, advertisements for bids on some projects included in the bill signed today by the Governor, had been started even before the Legislature had passed the measure. In this way fully thirty days had been gained in starting actual construction on the projects thus advertised. To speed up the work of preparing plans and specifications for other projects included in the bill signed by Governor Rolph, so that they will be available for contract within six months, Colonel Garrison announced that

architects other than those in the Division of Architecture will be employed.

DISTRIBUTION OF WORK

Included in the \$10,000,000 program scheduled to be under way within ninety days, are \$3,500,000 in building projects for state institutions, and \$6,500,000 in highway projects. The total of \$3,500,000 for state institution projects is in addition to \$988,000 in projects at these institutions, work upon which was started during the present month.

Colonel Garrison estimates that the work at state institutions will provide employment for 900 men during a period of thirteen months. Its wide distribution over the state adds to its value. The highway construction will give additional employment to 2500 men.

"EMPLOYMENT PREPAREDNESS"

"I have been instructed by Governor Rolph to get the state building program under way without a day's unnecessary delay," said Colonel Garrison today. "This is in accordance with the Governor's policy of providing the largest possible amount of public work at this time as a means of relieving unemployment and bettering business conditions. To accomplish this we have been forced to cut red tape and forget precedents. We are inaugurating a policy of 'employment preparedness,' which we believe will relieve unemployment to a very measurable extent, and point out a path for private business to follow. We intend to increase the amount of public work in the succeeding three-month period and instructions to this effect have been given both to the Division of Highways and the Division of Architecture of the State Department of Public Works."

STATEMENT BY GOVERNOR ROLPH

In signing the bill, Governor Rolph stated that the action of the Legislature in making possible the beginning of his building program constitutes a new precedent in appropriation measures for construction at the various institutions, and speeds up the building program at least six or eight months in advance of that which would have been possible had the appropriations taken their regular course in the general appropriation bills.

"Waiter, this pork chop has a piece of steel in it."
"Yes, sir, it came from a razor-back hog."

"I think there is just one thing which keeps you from being a bare-faced liar."

"What's that?"

"Your whiskers."

Hugh K. McKevitt Is Named Attorney for Highway Commission

At the first session of the California Highway Commission, Hugh K. McKevitt, San Francisco attorney, was selected by the commission as its attorney, vice Harry A. Eneell, whose resignation was presented to the commission and accepted by that body.



Hugh K. McKevitt

Mr. McKevitt has been a prominent member of the California bar for many years, and has been closely associated with Governor Rolph in many matters affecting the welfare and upbuilding of San Francisco. Mr. McKevitt has been particularly active in civil service matters, and under appointment by Governor Rolph, then mayor of San Francisco, has served with distinction as a member of the civil service board of that city.

NEW YORK—This state plans for a width of more than 40 feet on all highways by 1940, according to Superintendent of Public Works, Col. Frederick Stuart Greene. The Department of Public Works has adopted such an ultimate road-width map, based upon a traffic survey made in August, 1929.

Captain Cato Heads State Highway Patrol; Outlines Policies



Captain E. Raymond Cato

E. Raymond Cato, superintendent of the California Highway Patrol, succeeding Eugene Biscailuz, has had a long and successful experience in the Los Angeles Police Department. Mr. Cato joined that department in 1910 and by the merit of his service rose to the important position of captain of detectives.

In assuming the office of superintendent of the California Highway Patrol, Captain Cato said:

"I intend seeking for the patrol the full cooperation of police departments, sheriff's offices and law enforcement agencies throughout the state. I want my men to continue the policy of courtesy to motorists and to treat each case on its own merits.

"I aim to make the highways safe by keeping accidents at a minimum through a relentless drive against reckless and intoxicated drivers.

Colonel Garrison Asks U. S. Permit for S. F.-Oakland Bridge

The United States Government has been asked officially to grant a permit to the State of California for the construction of the \$72,000,000 San Francisco-Alameda County bay bridge along the Rincon Hill-Yerba Buena-Alameda mole route.

A request for the permit was sent to the War Department on January 16th by Colonel Walter E. Garrison, director of the State Department of Public Works.

Colonel Garrison acted as a member of and for the California Toll Bridge Authority, consisting of Governor Rolph, Lieutenant Governor Merriam, Highway Engineer Purcell, director of Finance Vandegift.

Simultaneously with the request for the War Department permit came the presentation of a bill in congress by Congresswoman Kahn asking for a permit from that body for the construction of the bridge.

The toll bridge authority, created by the 1929 Legislature to handle the toll bridge problems of the state, held a hurried early morning meeting in Governor Rolph's office and decided to make application for the War Department permit at once so that hearings could be held by the board of army engineers to be appointed from Washington, as soon as the thirty-day period of advertising necessary before the meeting can be called, has elapsed.

PHILIP A. STANTON HAS LONG AND DISTINGUISHED RECORD OF ACHIEVEMENT

(Continued from page 7.)

Mr. Stanton's ability has won for himself a distinguished place in California's political life. He was a member of the state Assembly from 1903 to 1909, serving both as chairman of the Ways and Means Committee and as speaker of the Assembly. During this period much notable legislation was passed including the legislation abolishing race-track gambling and the direct primary law. From 1912 to 1916 he was one of California's representatives in the Republican National Committee. He was also a candidate for the governorship on the Republican primary election of 1910, his candidacy receiving widespread support in all parts of California.

The California System of Compiling Motor Vehicle Accident Statistics

By VICTOR W. KILLICK, Statistician, Division of Motor Vehicles and California Highway Patrol

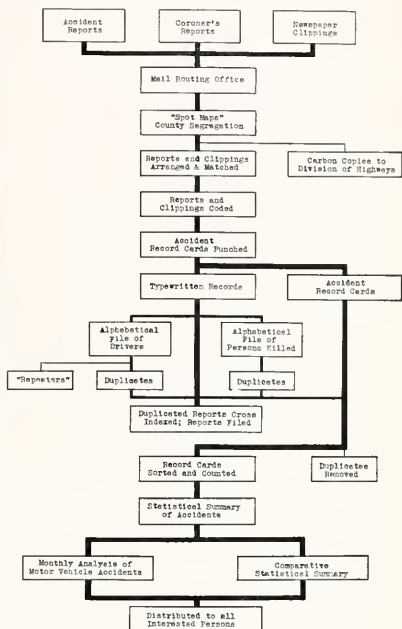
DURING the year 1930 the Division of Motor Vehicles of California introduced a new, complete and practically serviceable statistical system for studying motor vehicle accidents. This improved system has attracted so much attention throughout the United States and in Canada and England that it has become a burden to the statistical bureau adequately to describe the system in responding to hundreds of inquiries. The present purpose is to completely describe the system in a form which can be promulgated readily.

It is a source of gratification, not only to the statistical bureau, but to the heads of the Division of Motor Vehicles, that six other states in the Union are either reorganizing their motor vehicle accident statistical work to conform with the California system or are applying essential phases of it. A marked interest has also been taken by various safety organizations, city and county departments, auto clubs, insurance companies and the public schools.

The outstanding feature of the new California system is its usefulness. To many persons statistics mean only so many figures. As difficult and complex as it is to secure good, consistent and reliable data on traffic accidents, the matter of getting the full use of such statistics in a practical way appears to have been even a greater problem with the states and various organizations. It really requires technically trained persons to fully comprehend the meaning and the limitation of statistical data. Gross misinterpretation, costly and sometimes fatal experiments occur when the use of statistics is attempted by others.

BUREAU OF RESEARCH AND STATISTICS CREATED

In December, 1929, there was created a Bureau of Research, Statistics and Traffic Safety as a subdivision of the California Highway Patrol. Among the functions of this bureau were the gathering of traffic accident statistics throughout the state as required by Section 142 of the California Vehicle Act, together with the application of direct research in addition. The gathering



Routing Diagram of Accident Reports

of the statistics is, of course, fundamental but the application of research puts the statistics to use. These two functions combined form the back-bone of the California system.

The next important step in the organization of the system was the securing of well-trained, thoroughly experienced workers.

As at present constituted, the bureau is subdivided into four sections as follows:

1. Accident statistics
2. Motor vehicle driver statistics
3. Internal administrative statistics
4. Research

No discussion will be made in this article of the administrative statistical section which functions independently of the accident statistical section and is not directly related thereto.

The accident statistical section is under the direct management of an especially trained assistant selected chiefly for his thoroughness and constant vigilance. Securing reliable statistics from numerous sources in a large state like California requires perpetual vigilance. A good system once inaugurated will run automatically. Alert and virile management is constantly required to make it work.

GATHERING THE DATA

The gathering of motor vehicle accident statistics begins with the obtaining of an accident report of each individual accident. It is required by law that such a report be made by the driver of every motor vehicle involved in such an accident where either death or injury to human beings occurs. California does not require reports of accidents in which property damage only occurs. The law makes it optional with the driver to report motor vehicle accidents to either the Division of Motor Vehicles at Sacramento, its branch offices, the officers of the California Highway Patrol, the police departments, sheriffs or constables of local jurisdiction. Reports first received by city police departments and other agencies are in turn sent to the Division of Motor Vehicles at Sacramento monthly.

The first objective in the gathering of these reports is to get a report on absolutely every accident. This is not a simple matter to bring about. The mere fact that it is a legal requirement does in no way guarantee the Division of Motor Vehicles a report on each accident. Everywhere drivers are negligent in making reports and the division is obliged to consider this a question of law enforcement when cases of negligence are detected. The ability of the statistical bureau to detect such negligence, however, is naturally limited, but we have installed a scheme, now functioning more or less automatically, which enables us to get reports on more than 99 per cent of all accidents.

THE ACCIDENT QUESTIONNAIRE

The first feature of this reporting system is the blank upon which a report is made. It would be very surprising to the layman to

realize how much bearing this apparently insignificant form has upon the reliability of the data received as well as upon the effect it has in securing a report in every instance.

Several years ago a very carefully prepared letter-size form was introduced calling for 249 statements concerning the accident. Experience after operating with this for many months clearly showed that it was physically impossible for people to answer the questions consistently in all instances and furthermore the size of the report form made it unhandy for officers to carry the blanks with them when on patrol duty. Such officers frequently made casual notes on a handy piece of paper which often became lost or which did not fully answer the required questions in the questionnaire. The inadequacy of the old report blank was the subject of study for a period of twelve months involving consultation with representatives of the State Railroad and Highways Commissions, the auto clubs and the Division of Motor Vehicles. The present report blank which is approximately half the size of the former blank and which reduces by 50 per cent the volume of questions asked, was the development of a series of conferences. Every individual question asked was carefully considered before being adopted. Our present accident report form has greatly facilitated obtaining consistent and reliable data. In its application for over a period of six months it has greatly advanced the statistical work. Copies of this blank form and all others used in the system will be mailed to any interested persons upon request.

The outstanding features of the revised accident report form include a more specific description of the location with the idea of making it possible to effect the correction or repair of road conditions contributing to an accident. Certain items of engineering interest have also been incorporated to aid in describing dangerous sections of the highways. Numerous items of general interest contained in the old report form, but upon which no basis for remedial action could be taken, were omitted. After a field survey,

(Continued on page 23.)

FORMS USED IN CALIFORNIA MOTOR VEHICLE ACCIDENT STATISTICAL SYSTEM

The illustrated samples are the report blank forms used in the California accident statistical system. On the right-hand side the first two top forms illustrate the front and reverse side of the general report blank. On the left-hand side is a coroner's monthly report of deaths. Two small cards—one the record of driver's accident and the other the death record are referred to in detail in the text. The balance of the illustrations show the tabulating card used in the mechanical tabulating machine, the comparative statistical summary and the general statistical summary. Copies of any or all of these forms will be mailed upon request to interested persons.

NOTE Based on preliminary research on East

The Red Rock Canyon Highway

By E. K. GUION, District Office Engineer

THE marvels of nature through the famous Red Rock Canyon are being, in part, rearranged by the handy-work of man, as a splendid new State Highway is being constructed by the George Herz Company, which will make this wonder-spot available to the ever increasing number of nature loving tourists.

Red Rock Canyon is situate in Kern County on the Midland Trail approximately 24 miles north of Mojave.

The State Highway traverses Red Rock Canyon for a distance of about 2.3 miles following the westerly wall.

To nature lovers the desert offers a certain unexplainable enchantment. The desert country traversed by the Midland Trail in reaching Red Rock Canyon is by no means an exception, as this stretch is dotted with Joshua trees and occasional cactus. The air is filled with the fragrance of the familiar sagebrush. The tourist travels northward from Mojave over the improved State Highway by long tangents and easy rolling grades to a spur from the Tehachapi range, through which ready access is given by Red Rock Canyon. This canyon was doubtless formed by a fault generations ago and accentuated by cloudburst run-off. The action, together with the winds, has laid bare a most unique strata formation.

Mother Nature has laid this strata in nearly horizontal formation, being supported by occasional columns and spires, colored most enchantingly in many shades and hues.

The bed of the canyon proper averages about 100 feet in width. Inasmuch as this area is frequented by cloudbursts of considerable proportion, a rather unique construction problem was presented. This was met by locating the State Highway some 15 feet above the floor of the canyon and setting the roadway well into the walls by what is commonly called "contour construction." The excavation material thus obtained was used to support a portion of the roadbed on embankment. This in turn called for special protection work in order that the material might not be lost by erosion.

The outer five feet of the embankment was constructed entirely of rock which was carried down below the bed of the wash about six feet into a trench, which was also given



Relocation of State Highway in Red Rock Canyon

a five foot width beyond the toe of the extended embankment. The rock was then carried out on a $1\frac{1}{2}$:1 slope to the bed of the creek, which in turn gives a supporting foundation of considerable proportion consisting entirely of rock.

The outer face of the rock on the embankment was all hand-placed and arranged to present a smooth face to the flow.

The picture above gives a general view of the canyon. On the right the existing traveled way may be observed, occupying a grade approximating that of the wash area which is shown in the view. Any flow immediately puts this whole road under water and out of service. On the left is shown the new State Highway now under construction. A close study will reveal the rock protection for the embankment. In the background of this view is a striking illustration of strata formation typical of the Canyon. The view, of course, does not do justice as the color is not apparent.

Governor Rolph Outlines Policies Governing Public Works Program

THE inaugural message of Governor Rolph dealt both forcefully and directly with activities of the state, the administration of which is vested in the Department of Public Works.

The following article comprises excerpts from the message dealing with these subjects, and setting forth in detail the views of Governor Rolph on these matters and the policies governing them he will initiate and support.

STATE HIGHWAY SYSTEM

The economic distribution of our products from farm, factory and mine to market, is a problem of general interest. The main arteries and laterals of our great highway system tap the places where our products are produced.

The increase in tourist travel through California is an example of the great service our highway system, as developed to the present date, has rendered. The motoring public has assumed the obligation of constructing and maintaining the state system of highways, and also of assisting our county systems with one-third of the total gas tax revenue and one-half of the motor vehicle fees. California's highway system, as now established, consists of a total of 6590 miles of which there are 4287 miles of primary roads and 2303 miles of secondary roads.

For the maintenance and expansion of our highway system, the state highways receive from the motor vehicle revenues, fuel tax, and federal aid an allotment of approximately thirty-one and a half millions a year, and the counties also receive from the motor vehicle revenues and fuel tax about one-half that amount per year. The state highway fund is expended under the terms of the Breed act. I will not occupy you now with a statement of details showing the allocation and application of that fund.

Federal aid which has been available by act of congress since 1921 is for projects on the federal aid system, only, the federal aid system being state highways selected by the federal government in 1921 as the federal aid system. This amounts to approximately four and a quarter million per year under the existing authorizations.

I believe that we should continue our program of building and improving the state highway system and that the development should be carried out on a balanced program, both in the sparsely settled mountain and desert areas as well as in the rich valley and urban regions. It is essential to the proper development of our state that a fair distribution of mileage commensurate with the funds for this purpose be made. The development of our system either north or south is a benefit to the entire state. I am in accord with the principles laid down by the last legislature in considering the addition of new highways to the state highway system, as this recognizes the lack of balance between the mileage of secondary roads in the south and in the north.

I expect to ask our highway authorities to cooperate in the construction of roads inside incorporated cities that are logically direct connections and a part of our state system to the extent possible with the funds available under existing law, without jeopardiz-

ing the carrying on of the state highway program. Necessarily, at the start, this class of work will be limited to points where the conditions are most acute with respect to passing traffic in and out of towns and cities, and where communities are least able to bear the burden. Where the highway system does damage to the smaller towns in passing through them, justice demands our aid. Such aid is compulsory in towns under populations of 2500 and optional above that.

The highway work should be expanded as rapidly as funds can be provided, in order that during this temporary period of unemployment the greatest number of our citizens can be put to constructive work as soon as possible. Approximately eighty-five per cent of each dollar expended on highways goes directly or indirectly to labor. It is important that the legislature proceed to make the funds available at the earliest possible date for carrying out the program of highway construction.

TRANSBAY BRIDGE

Ever since the earliest days, traffic between San Francisco and Oakland has been by ferries; at all times this has created a serious traffic problem. Industrial science and improved construction methods now afford us a solution of this traffic problem by building a bridge connecting the counties of San Francisco and Alameda.

The history of this bridge begins some ten years and more ago, when private capital sought franchises from the city and county of San Francisco, under the old Toll Bridge act, for permission to build a bridge between San Francisco and Alameda counties.

There was a rush of applicants for this permission and after years of hearings before the supervisors, the city appropriated a sum of money and appointed an engineering board consisting of the City Engineer of San Francisco, John Galloway, and Robert Ridgway, who in an exhaustive report found that it was feasible to build such a bridge.

They approved several tentative sites, numbering them in the order of their approval, but stated that they could not definitely approve any site owing to the lack of foundation data.

In 1928 it became apparent that the state should assume the obligation of building this tremendous undertaking, and to this end the legislature in the 1929 session passed the necessary legislation placing this projected bridge under state control.

The war department had continuously refused permission to build such a structure north of Hunter's Point, but during the early part of last year, President Hoover and Governor Young appointed a joint bridge commission consisting of navy, army and civilian

membership, and this commission in a signed report unanimously approved the feasibility of such a structure, conserving both the interest of navigation and national defense.

In 1930, the Hoover-Young bridge commission made its report to the President and the Governor. This report cleared the way for the actual construction of the bridge. Under the auspices of the state highway engineer and after exhaustive borings were made, plans and estimates for a double-deck bridge were submitted to the commission, accommodating motor vehicle traffic, and interurban cars. The estimated cost was seventy-five million dollars, which money was to be found by the sale of revenue bonds. The report showed that these bonds could be retired and interest paid on them by anticipated traffic, as shown by traffic surveys.

All toll bridges in the state should, I believe, be freed from tolls as soon as economically possible and be made a part of the highway system. The highway commission is charged with the determination of the location and routing of roads, and in my judgment should stand squarely behind this movement to insure the completion of this bridge, serving one-quarter of the state's population, resident to the San Francisco bay area.

This bridge will be the most stupendous undertaking of its kind in the world. Under proper financing and safe and economical construction, and under the able direction of the state authorities, in cooperation with the world's best engineers, it will prove a boon to the State of California, and fill a long felt want of the great metropolitan area of San Francisco bay.

The necessary additional legislative measures are now under way. There is pending a case before the Supreme Court to determine the validity of the bonds and bill to be presented to congress and to the state legislature in order to facilitate the early starting of the work, with the hope that it will commence before the close of this year.

It is extremely important, in my opinion, that these two great communities be afforded modern methods of communication with each other, and this at the earliest possible moment.

THE WATER PROBLEM

Only a brief reference to the water problems of California is possible in this message. I assure the legislature and the people, however, that I am not unmindful of those problems; the problems of flood control in the northern valleys and in the Santa Ana river system, of saline encroachment in the lower reaches of the Sacramento river, and of the drying-up of the lands in certain southern sections of the San Joaquin Valley. A coordinated solution of these problems has long and earnestly been sought. Surely, in California, where water is so precious, the state must devise a general unified plan for the conservation and use of its water against the increasing needs of its increasing population and the demands of the coming generations whose stewards we are. No complete or satisfactory solution has been found yet although the elaborate and expensive studies heretofore made will doubtless aid in the ultimate determination of a plan. The difficulties are mainly financial. Economically, the cures proposed thus far seem about as bad as the disease. We may not rob or wreck one section, industry, or group in order to sustain another. We must not spend more in salvaging lands than the lands will be worth when salvaged. We cannot impoverish the farmers of any section in

order to bring under cultivation lands whose yield will merely augment the existing over-production of farm products. As the Joint Committee of the senate and assembly said in its final report, submitted January 18, 1929 (p. 15) "development should not proceed more rapidly than economic needs of the state require." We must be sure we are right before we go ahead with any plan. Yet we should not permit any section, industry or group to languish and suffer unduly for lack of energetic action on the state's part. I stand ready as Governor to give the legislature and the distressed localities all the assistance in my power toward finding a practicable solution of these pressing problems. We must not approach these problems in a narrow or sectional spirit. While the benefits sought may primarily effect certain localities, the evils we seek to cure have been brought into being by causes that are not local. Every irrigationist along the upper stretches of the Sacramento, the Feather and the American rivers, has contributed to the slow salting of the distant delta by tidal trespass. We cannot heal these real woes by sympathy or fair words, however sincere. Distinctly, the duty of relieving the acute situation caused by the uneven distribution of our water resources and the growing demand on them is mainly the business of the state and not solely of the affected localities. The Hoover-Young commission has submitted a report. To give that report the serious consideration which it merits will be one of your duties and mine during the current session of the legislature.

Fortunately, definite progress has been accomplished toward the construction of the Colorado river dam and thereby toward relief of the great and populous coastal plain of Southern California from the menace of a water famine. All the forces of the state government will be constantly available to aid in smoothing out the obstructions that still lie in the way of the completion of the Boulder dam.

Nor must we forget that water is not the only natural resource of California calling for conservation. Our wealth of natural gas must not be wasted. The water will continue to flow so long as the snow and rains continue to fall, but natural gas once escaped cannot be recaptured and the supply is not inexhaustible and cannot be replenished. So, too, our forests, which, once destroyed, cannot be replaced for ages, present an acute problem. They must have adequate protection from destruction by fire through wise, preventive measures.

RECLAMATION AND FLOOD CONTROL

I have inherited from previous administrations a tremendous and pressing problem in the reclamation and flood control projects in which the State of California is interested. It would be impossible at this time to review in detail the many ramifying aspects which are presented and, therefore, I shall advert only to the principal policies which shall govern my administration regarding them. The importance of the subject is readily apparent when it is understood that the Sacramento and San Joaquin drainage district, a state agency, comprises 1,115,000 acres in the Sacramento and San Joaquin valleys, and that the California debris commission has estimated that the project completed will cost \$51,000,000.

The above estimate grew out of the commission's report of 1925, sometimes referred to as the "Grant Report," and sometimes as the "Revised Report," which was adopted by congress and approved by President Coolidge, February 28th, 1928. This report has also been adopted by the State of California,

and is the basis for the participation of the state government, and the landowners affected, with the federal government. It recommended that the annual appropriations from the federal government be increased from \$500,000 to \$1,000,000 per year, the limit set by the existing law, which recommendation was adopted by congress in the enactment of the Curry bill in 1929, under which the federal government appropriated \$1,000,000 as its yearly contribution, whereupon the State of California matched this amount by appropriating \$1,000,000 for each of the 81st and 82d fiscal years, the latter ending June 30, 1931.

The basic understanding behind these appropriations was that the costs of the great works of flood control and reclamation should be borne one-third by the government of the United States, one-third by the State of California, and one-third by the landowners living within the defined area. The program for the fiscal year ending June 30, 1932, so far as the federal government is concerned, already has been approved by the chief of engineers and is based upon the federal appropriation of \$1,000,000 for work during that fiscal year. The obligation of the State of California to make equal appropriations with the federal government has been many times definitely stated and publicly recognized, and in order that the State of California shall do its full part I have caused to be inserted in the budget of my administration for the 83d and 84th fiscal years an appropriation of \$2,000,000, and I have no hesitation in stating as a definite policy that the State of California during my tenure of office will continue to go forward in step and in alignment with the government of the United States toward the completion of the tremendous works of improvement contemplated by the report of the California debris commission.

There is another problem involved in these policies which appeals to me as being of even greater importance and concern. I refer to the pressing plight of the landowners and farmers whose holdings are situated not only within the boundaries of the Sacramento and San Joaquin drainage district but also within the confines of separate and distinct reclamation and irrigation districts superimposed as it were upon the land of the greater district.

The homes, the holdings, and the very existence of these landowners are imperiled by the appalling underlying reclamation and irrigation tax burdens upon their lands. It is now a matter of common occurrence that banks in many cases have refused originally to grant, or, in other cases, to renew, mortgages upon these country lands because of the staggering liens from reclamation and irrigation taxes which would be anterior to the ordinary land mortgage. In many cases the ruin of a life's work and the destruction and loss of all he possesses stare the landowner in the face.

The state should find some means of assisting these farmers and citizens. In the Sacramento and San Joaquin drainage district alone in November, 1930, as evidenced by assessments No. 2, No. 6 and No. 7, there was still outstanding against affected lands the large sum of nearly \$7,000,000 in underlying liens. The unfortunate part of the situation is that in addition to this huge sum the lands involved are in turn again situated in smaller districts, and the lands have again been saddled with large underlying liens imposed for the purpose of creating and completing the local problems of reclamation and irrigation.

As I said before, this phase of the reclamation tax problem appeals to me most strongly, and I shall do everything in my power during the coming years of my administration to lessen and alleviate it. I hope that with careful study and intensive analysis some

means will be found whereby the state itself can be of aid in refunding and refinancing the reclamation and irrigation liens and encumbrances. I pledge myself and my administration to use every means at our disposal not only to fulfill the obligations of this state in the completion of its great reclamation and drainage projects, but also to aid and assist by every means possible the landowners and agriculturists who are so vitally threatened.

STATE INSTITUTIONS

The greatest business of the state is the business of government, and it is the least understood. Government should be conducted on lines of economy, but not on a basis of parsimony.

Real economy consists in honest and reasonable expenditure of the people's money in return for general advancement of the public welfare. Any economy which denies to the state's unfortunates the comforts due to human beings is false economy.

As Governor I stand for an economical administration of the state's affairs. But I shall refuse to make a political record through starving the state institutions. I shall refuse to recommend inadequate appropriations for the relief of state institutions merely to gain the plaudits of those who do not understand the crying needs of the state. This state may well be proud of the great institutions which have been built for the shelter of the unfortunate and the care of the needy. Many of these institutions are in need of immediate repair, as well as extensions. Their facilities must keep pace with the growth of our population.

The poor, the stricken and the unfortunate shall have a first claim on the consideration of my administration. Every poor creature, bereft of reason, should have a bed in which to sleep, comfortable habitations in which to live, decent and sanitary surroundings and wholesome food. This is the very least that humanity has a right to demand.

I shall consider my administration a failure if, through parsimony or neglect, the poor state's unfortunates shall fail to receive the ordinary comforts of life. What means the wealth of the State if those who have faltered by the wayside of life do not receive the common charity due to all men?

Many of our state institutions are in need of enlargement to keep pace with the demands of public growth. There, should be no waste of funds, no needless expenditures, but there should be an adequate building program to tenderly care for all the state's unfortunates. Furthermore, some of our state buildings are approaching the point of decay. They should be promptly and immediately modernized in order to protect the lives of their unfortunate inmates. Fire in any of these institutions would be an appalling disaster. A record in tax economy would stand as a feeble answer to the appalling charge of neglecting the safety of the unfortunate wards within this and other buildings. Disaster such as has confronted the public institutions of other states would leave a blot upon our history that no record of false economy could make us forget.

Our state prisons present one of the great problems of modern society. Owing to the complexity of our laws, the enactment of innumerable statutes and other causes, our state prisons are becoming overcrowded. Penal institutions should not by overcrowding be made into houses of torture to break the spirits of men. While discipline and punishment are necessary to those who break the law, an opportunity should be afforded to all to reform and to rebuild their lives.

While I do not believe in nurturing or mollycoddling criminals, I believe that vast numbers of men who have been led astray can, by proper effort, be reformed.

Our state prison system does not permit of the segregation of criminals. The petty offender is too frequently made the constant companion of the cut-throat and the gunman. An enlightened system of penology points to the classification of criminals where those of milder degree are not thrown in constant contact with the vicious and degraded type. Our overcrowded prisons are a breeding place for future crimes. Broken, dispirited men, merely plot against their fellows. Soured and embittered, they plot against society. Our state prisons should be so enlarged that they will give opportunity for segregation and for constant and wholesome employment for the inmates.

The state, at least, owes the duty to society of trying to lessen the crimes of the future. Discipline, rigid and even severe, must be imposed on those who break the law, but these violators of the laws of their country are men, within the breasts of whom there must be some spark of human good. Be that instinct toward good, small or great, we should encourage its development in order to lessen the prospects of future crime. Relief from crowded and intolerable conditions, even at the expense of building added prisons, should be looked to to solve this problem.

The institutions for the blind and for the feeble minded should have our especial care. I commend to the Legislature enactments which will give to the sightless unfortunate of the state the last possible need of encouragement and support. We, who have eyes to see, should, in return for our blessings, stint no effort to give to the blind every possible opportunity for education, wholesome surroundings and congenial occupations. I shall consider that my administration has some claim to remembrance if it shall make the cause of these poor but proud and dependent wards of the state, the special object of our care.

Little does it comfort us, though the public at large be prosperous and happy, if our less fortunate, broken, sightless or demented kindred are forgotten and neglected. The cry of human need is the first call that we must answer.

Courtesy Wins Commendation for Highway Patrol

Many letters are received by the Division of Motor Vehicles commending officers of the California Highway Patrol for courtesies extended to and assistance given motorists. The following letters are typical of scores of others received:

A. C. Powers of Sacramento thanks Officer Warren for assistance given in a wreck near Livermore in which one life was lost. The letter says:

"Officer Warren was on the scene a few moments after the distressful accident occurred, and I wish to attest the efficiency, skill and human kindness he displayed in handling the situation. I am sure that if the personnel of the Highway Patrol possesses the tact, good judgment and human understanding that

Officer Warren showed that we Californians may be proud of having the best Patrol to be found anywhere."

Mayor Herman Logan, Vancouver Barracks, Washington, writes to express appreciation of the kind and courteous treatment received from Officer Richard White, during an automobile accident close to Empire on the Redwood Highway, Monday, December 15, 1930.

Leland S. Weeks of Stockton writes of assistance received from Officer Thomas Sheldon and Donald Haldeman when his car skidded from the highway near Merced. The letter concludes:

"I am not eloquent enough to say what I would like to say about your California Highway Patrol. Without doubt all of your other officers are of the same caliber as the young men I have just mentioned. Motorists are beginning to look upon the Patrol as an agency of friendship and assistance, worthy of full cooperation. I am glad to subscribe to this opinion. The continuation of such a spirit of helpfulness on the part of your officers will rapidly make of the Patrol a service with a tradition.

L. F. Hockley of Oakland thanks State Highway Patrolman Tony Rose, Alameda County, for assistance given when his car was stalled on the highway and he faced the probability of an all-night stay there.

Floyd Colbert of Sacramento thanks Captain Reynolds, Officer Essenhuth and other officers whose names were not obtained for aid given when his car was wrecked.

There are scores of letters from women motorists, expressing appreciation of aid given by patrol officers in changing tires, etc. Many other letters tell of courteous, but firm manners in which the officers have corrected autoists for some inadvertent infraction of motor vehicle rules.

Here are just a few excerpts from these letters:

"It is indeed a pleasure to travel the highways of California knowing that you have these guardians within a few miles all of the time to give you aid and assistance."

"Conduct and courtesy of this kind is commendable, and a credit to you and your department."

"I want your Bureau to know that your officers are adding kindly assistance beyond and above their duties."

"I shall always have a kindly feeling in my heart toward every man who wears the uniform of the California Highway Patrol."

"You certainly are to be complimented on your efficient and capable organization."

A slow-pay customer sent the following note to his grocer: Please send six dozen eggs; if good, will send check."

The grocer, however, was not doing any business on such risky terms, so he wrote back: "Send check; if good, will send six dozen eggs."

Ratio of Motor Vehicle Deaths to Gasoline Consumption Is Told

AT LEAST nineteen states of the Union have motor vehicle death rates based on gasoline consumption that are higher than California.

This was revealed today in a comparison of motor vehicle accidents of states prepared and released by the bureau of research, statistics and traffic safety of the Division of Motor Vehicles.

The rate for California is 1.81 deaths for every million gallons of gasoline consumed. Of the thirty-four states included in the bureau's study, California is fifteenth on the list. The bureau concludes that this puts California in a relatively favorable light inasmuch as the death rate is well below the general average of other states.

The study shows an average death rate of 1.99 for the thirty-four states included, North Dakota being lowest with 0.80 and West Virginia being highest with 2.62. The figures are all based on motor vehicle fatalities and gasoline consumption for 1929. California motorists consumed approximately 1,241,000,000 gallons of gas for the year and there were 2,244 deaths.

The bureau regards death rates based on gasoline consumption as the fairest basis for comparing fatalities between states inasmuch as a motor vehicle is exposed to accident hazard in direct proportion to the number of miles it is driven.

"It follows that motor vehicle death rates created by computing a ratio of deaths to the consumption of gasoline in each of the states will be quite truly comparative, statistically speaking," the bureau's statement said.

"The gasoline consumption ratio reduces the motor vehicle deaths to a common denominator by which we may compare one state with another without incorporating errors of unknown quantities as may be done when comparisons are made on other bases. The vehicle that travels twice as far as another is naturally exposed to twice the hazard. This condition is equally true in all states."

The bureau points out further that the California vehicle is likely to be exposed to greater traffic hazard than cars driven in almost any other state since favorable weather

conditions here permit the all-year use of motor vehicles.

A table showing the death rates computed for the various states, based on gasoline consumption, follows:

**MOTOR VEHICLE DEATH RATE BY STATES
BASED ON GASOLINE CONSUMPTION FOR
1929**

A	B	C	D	D/C
State	Gasoline consumed, million gallons 1929	Total motor vehicle deaths 1929	Rate per million gallons	
1 North Dakota -----	124.3	100	.80	
2 Iowa -----	335.6	403	1.20	
3 Kansas -----	360.9	439	1.22	
4 Nebraska (A) -----	387.3	235	1.81	
5 Oregon -----	163.6	237	1.45	
6 Oklahoma -----	316.3	478	1.51	
7 Rhode Island -----	77.8	128	1.52	
8 Dist. of Columbia -----	71.8	112	1.56	
9 Massachusetts -----	501.9	786	1.57	
10 Maine -----	96.0	151	1.57	
11 Montana -----	79.1	125	1.58	
12 Idaho -----	55.1	93	1.69	
13 Wisconsin -----	393.3	701	1.78	
14 Missouri -----	392.9	706	1.80	
15 California -----	1,240.9	2,244	1.81	
16 Delaware -----	32.5	61	1.83	
17 Arizona -----	72.8	140	1.92	
18 Michigan -----	785.2	1,541	1.96	
19 Arkansas -----	134.6	272	2.02	
20 New York (B) -----	1,000.4	2,044	2.04	
21 Wyoming -----	34.5	71	2.06	
22 New Mexico -----	45.7	94	2.06	
23 Florida -----	223.8	464	2.07	
24 Connecticut -----	202.3	426	2.16	
25 Illinois (C) -----	338.6	840	2.16	
26 Virginia -----	208.3	475	2.28	
27 North Carolina -----	265.1	614	2.32	
28 Ohio -----	953.5	2,278	2.39	
29 Kentucky -----	154.8	376	2.43	
30 Indiana -----	432.0	1,054	2.44	
31 Pennsylvania -----	900.4	2,198	2.44	
32 New Jersey -----	498.0	1,275	2.56	
33 Alabama -----	178.1	467	2.62	
34 West Virginia -----	126.5	332	2.62	
Total for 34 states -----		11,033.9	21,970	1.99

(A)—Estimated for 10 months.

(B)—Estimated for 8 months.

(C)—Estimated for 5 months.

BIRTH STONES

For laundresses, the soapstone;
For architects, the cornerstone;
For cooks, the puddingstone;
For soldiers, the bloodstone;
For politicians, the blarneystone;
For borrowers, the touchstone;
For policemen, the pavingstone;
For stock brokers, the curbstone;
For shoemakers, the cobblestone;
For burglars, the keystone;
For tourists, the Yellowstone;
For beauties, the peachstone;
For editors, the grindstone;
For motorists, the milestone;
For pedestrians, the tombstone.

—The Parade.

Census Bureau Reports Show Increased Danger in Auto Traffic

AN INCREASE of more than 3000 deaths from automobile accidents in the United States last year was indicated in a statement by the Bureau of the Census, Department of Commerce.

This estimate was based on actual figures from the death registration area, comprising more than nine-tenths of the country.

Four states of heavy population—New York, Pennsylvania, Ohio and California—recorded the greatest number of fatalities from this cause, although a state of small population—Nevada—had the highest death rate, it was stated.

The statement, made public by the Department of Commerce, follows in part:

"The Department of Commerce announces that in the death registration area in continental United States accidents in which automobiles were involved caused 29,531 deaths in 1929 with a death rate of 25.4 per 100,000 population. Of this total, collisions of automobiles with railroad trains and with street cars were responsible for 1958 and 507 deaths, respectively, which, if excluded, would leave 27,066 deaths with a death rate of 23.3.

The death registration area in 1929 was composed of 46 states, the District of Columbia, and nine registration cities in nonregistration states, and included 95.7 per cent of the total population of continental United States. Assuming that the same death rate would hold true for the remainder of the continental United States, the number of deaths in 1929 from accidents in which automobiles were involved is estimated at 30,858 for the whole country, as compared with an estimate of 27,618 for the year 1928. These figures indicate an increase of over 3000 deaths from this cause in a single year.

Comparing the states, the greatest number of deaths occurred in New York (3192), followed by Pennsylvania (2331), Ohio (2320), and California (2271). Nevada has the highest death rate per 100,000 population (51.1). Next in order are California (41.2), Arizona (36.2), Florida (35.5), Ohio (35.3), Indiana (34.1), and Wyoming (33.7).

It is gratifying to observe, however, that if collisions with railroad trains and street cars are excluded the following eight states, Delaware, Idaho, Illinois, Montana, Oregon, Rhode Island, Vermont, and Wisconsin, had fewer deaths than in the previous year.

The number of automobile deaths reported for each state and city includes those due to accidents outside of the limits of the city or state. If these and collisions with railroad trains and street cars are excluded, the cities would rank as follows: New York City, with 1328 deaths, Chicago (729), Los Angeles (390), Detroit (369), and Philadelphia (356). Other cities with over 100 deaths are Cleveland (294), St. Louis (152), Pittsburgh (150), Baltimore (143), Buffalo (136), Boston (133), Cincinnati (121), Newark (121), Indianapolis (107), San Francisco (107), and New Orleans (103). Cities with the highest death rates per 100,000 population, however, are Youngstown (42.4), Gary (40), Camden (37.6), Long Beach (36.7), Miami (35.7), Cleveland (32.9), Los Angeles (32.8), Canton (32.6), and Columbus (30.4). The lowest rate shown is that for New Bedford (7.9).

Chicago had the greatest number of deaths from collisions of automobiles with railroad trains (26) and with street cars (30). Next in order are Gary with 14 deaths from collisions of automobiles with railroad trains and Los Angeles with 19 deaths from collisions of automobiles with street cars.

An interesting phase of the report is the extent to which accidents outside of the city limits form of the total crude death rate. In the case of Albany, Camden, Fort Wayne, Grand Rapids, Hartford, Springfield, Mass., and Trenton, the number of these accidents play a very important part in the total number of deaths from automobile accidents."

The census figures distribute deaths from automobile accidents in California for 1929 as follows:

Total number of deaths.....	2271
Total number of deaths in collisions with railroad trains.....	117
Total number of deaths in collisions with street cars.....	54

THE CALIFORNIA SYSTEM OF COMPILING MOTOR VEHICLE ACCIDENT STATISTICS

(Continued from page 14.)

reduction of the size of the report to $8\frac{1}{2} \times 5\frac{1}{2}$ " was determined to be highly desirable due to the ease with which it can be carried in the saddle bag of a motorcycle, or when once folded, in the inside coat pocket of a pedestrian officer. It is important that the report blank be carried to the scene of the accident if full information is to be obtained.

PROCESS OF COMPILING

After the accident reports come to the Division of Motor Vehicles at Sacramento they pass through a mill of scrutiny. At every point in the operation of this process certain information is abstracted from the reports which is at once put to work and also forms the basis of the statistical accounting. The accompanying diagram illustrates the routing of the reports through the statistical bureau and indicates the action which is taken at each step.

All of the accident reports fall into two major groupings: Those in which deaths occur and those in which injury only occurs.

Principal attention is given those reports in which a death occurs. In fact the bureau individually investigates every such case. It is required by law that coroners report all traffic deaths once a month to the division. These reports form an official and authentic record of the number of motor vehicle deaths. The coroners' reports furthermore serve as a basis to check, in part, the total amount of all accident reports.

A commercial newspaper clipping service of traffic accidents is used. The newspaper clippings are compared with the accident reports received from individuals as a check on the total number. If a coroner reports a death on which no accident report has been received, the bureau immediately investigates the reason for the non-receipt of the original report. The same process is employed when newspaper clippings reveal that accidents have occurred on which the department has not received a formal report. These investigations are conducted with the aid of the various captains of the California Highway Patrol.

THE ROUTING THROUGH BUREAU

In studying the accompanying diagram it will be noted that the reports issuing from the three sources of information consisting

of the accident reports, the coroner reports and newspaper clippings, come into the office through the mailing room. At this point all mail relating to the statistical bureau is segregated from the general mail of the Division of Motor Vehicles and sent to the bureau.

On arrival at the bureau the accident reports are received at the desk of a clerk whose duty it is to maintain spot maps by counties, a few of the largest cities, and for the state as a whole. On these maps pins are inserted for deaths and accidents according to geographical location. The purpose of the maps is to indicate the relative congestion of accidents so as to attract attention to any location in which a local hazard may exist otherwise unnoticed.

COORDINATION WITH HIGHWAY WORK

At this point also carbon copies of certain highway accidents are made and dispatched to the State Division of Highways so that division is made aware of those locations on the highways in which accidents are happening and re-occurring and in which it may be possible that constructional engineering features may in part be responsible.

The next step consists of matching the reports and newspaper clippings. At this point a clerk is engaged in noting and weeding out the duplicates and in noting the absence of reports in cases on which a newspaper clipping is received only. Reports for each county as a unit are arranged by date of occurrence. The newspaper clippings go through the same procedure. The clippings are attached to the report to which they refer. All clippings of accidents not reported by police and other agencies, etc., are mounted on blank report forms and placed in order by county and date. Duplicates found during this procedure are brought together and attached.

From this point the next step is to one of preparation for mechanical tabulating. It consists in numerically coding the items in the accident reports and clippings. This facilitates the work of a key punch operator who immediately thereafter receives the reports and punches on a machine a card for the accident according to the code as a permanent record.

The only information not coded is the age of the drivers and the age of the injured or killed. These ages are punched directly on the card as this has the advantage of permitting studies being made by any desired age groupings for either regular or special reports. The punching is performed with the aid of an automatic key punch machine, per-

forations being made at certain points on the card. Each original card in the California system represents one accident and one person killed or injured, giving all information pertaining to the accident. A duplicate card is made for each additional person injured or killed in which the accident information is repeated, but those items referring to the individual injured or killed are changed according to his or her age, sex, extent of injury, action and physical condition. Such duplicate cards are used only for the information they contain in reference to the individual.

The accident record cards are punched by county units according to the alphabetical arrangements of counties and numbered consecutively. This gives a natural sequence by which the original reports may be referred to by number without knowing the date or location of the accident. During the punching of these cards the "Coroner's monthly report of motor vehicle deaths" is used to verify the age, date of accident and death, etc., of each person killed.

SPOTTING THE BAD DRIVER

It will be noted on the diagram that the main routing line breaks immediately after the record cards of the accident are punched. The diagram indicates that typewritten records are set up on one hand and accident record cards are set up on the other hand. The typewritten records refer to the making of special card files relating to drivers of cars involved in accidents and for those killed. These two files are alphabetical. One is based on the names of the drivers involved in accidents, providing spaces for five accidents. It gives the accident number, date and county of occurrence, whether fatal or non-fatal. This will show how many times an individual driver may have been involved in accidents. This file is presided over by a clerk who is constantly searching for "repeaters." When a card is detected for a driver who has been involved in three or more accidents the name and record of this driver is immediately turned over to another bureau of the California Highway Patrol for the direct investigation and possible re-examination of such a driver with the view of revoking operator's license should that appear advisable. The alphabetical drivers' file serves the purpose of a cross-index to the general file. It is one of the most valuable and important, practical features of the whole system. To emphasize the important features of this file the following points should be noted:

1. It indicates "repeaters" (persons having several accidents)
2. It eliminates the possibility of duplicate reports occurring in the same month or any two or more months.
3. It provides a means of determining whether or not a particular accident has been reported.
4. It provides the quickest and most complete accident record of any driver under investigation.
5. It serves as an auxiliary function in aiding locating or tracing "missing persons."

At the time the "Record of Driver's Accident" cards are typed, another card is also made. It is an alphabetical file of persons killed. This file was established for the following reasons and has proven of great value:

1. Eliminates the possibility of duplicating deaths. (The same individual has been reported killed two consecutive months by the same coroner).
2. Provides a means of locating reports of fatal accidents when the driver's name is unknown. (Example—"hit and run" cases).
3. Provides a means of determining whether a "missing person" (or others) was killed in a motor vehicle accident.

It further serves as a cross-index to the general filing system.

TABULATING

After all the typewritten records are prepared as above, duplicates removed and destroyed, the accident record cards are ready to be sorted and counted. They are then passed into the tabulating room where they are run through a mechanical tabulating device and automatically sorted and counted.

The mechanical counting-sorter is used for this purpose and the totals obtained in each item are written in the space provided on the statistical summary sheet or office record. In the process of this operation another search for duplicates is made and if an occasional one is found it is weeded out to make the final statistical count a net total.

MONTHLY STATISTICAL SUMMARY

This summary is a compilation of the accident reports involving personal injury or death. A full description of the arrangement and plan of this summary is explained on the reverse side of the form. The general plan includes four sections as follows:

Section 1: Statistics on persons involved in accidents.

- (1) Those killed and injured
- (1a) Drivers involved
- (1b) Pedestrians involved

Section 2: Statistics on vehicles involved

- Types of vehicles
- Conditions of vehicles

Section 3: Statistics on time of accidents

- Hour of occurrence
- Light conditions
- Day of occurrence

Section 4: Statistics on roads and weather

Road location
 Road surface
 Road conditions
 Weather conditions

This summary is prepared once a month and is recapitulated annually and semi-annually. Upon the completion of the monthly summary sheet certain outstanding items are abstracted from the report for publication. These items consisting of six in number set forth the total number of accidents during the month, the persons killed, the persons injured, the drivers involved, the pedestrians involved and the vehicles involved.

The report is issued promptly in mimeo-typed form designed to show a comparison with the corresponding figures of the same month a year ago; the total for the year to date compared with the corresponding total of the year previous.

Accompanying this comparative statistical summary each month there is a written analysis prepared by qualified statisticians explaining other more technical features of the complete statistical summary. The distribution of these reports is made in relatively a large volume but is very carefully directed to individuals and institutions which are actively engaged in promoting traffic safety conditions. Frequent revision of the mailing list is made in order to avoid sending these reports to those who are not actively engaged in such safety matters.

RESEARCH

Upon the completion of the monthly statistical summaries, the reports are finally scrutinized by the chief statistician. At this point the technical research begins. All outstanding features of the statistical summaries are carefully charted and various experimental technical studies are being continually carried on with a view of more adequately explaining conditions which may not be at once apparent to the statisticians themselves. When the figures indicate that possibly some important significant matter is escaping attention a field research study may be made to determine more precisely the nature of the problem. In this work a district in the state may be selected and the traffic officers of the Highway Patrol instructed to report in very specific detail additional matters to those contained in the ordinary accident report. Extended correspondence with drivers involved in accidents and direct investigation of wrecked cars and injured persons are also employed. Photography is resorted to. Much practical and enlighten-

ing information has been developed during the last twelve months from these field research studies. In some cases the results of such research work have been quite startling, revealing the fact that the accident reports in themselves although being a reliable indication of volume of certain accident classifications, seldom reveal the controllable causes of the accidents. These controllable causes have been largely exposed through the field research operations rather than by the statistics themselves. On the other hand the statistics have indicated the need of the field research in a definite direction.

Upon finding useful facts in the research studies, every possible effort is made to set such facts to work. Reports carrying recommendations are sent direct to every agency or organization of the state which can directly employ them. The findings are further disseminated to other states. The research section maintains a consultation service for all who seek its advice and handles a large volume of correspondence in this work.

In conclusion the development of the California system of motor vehicle accident statistics is the outcome of a gradual evolutionary process. Many outside influences have contributed to the success of the system. We would be derelict in duty were we not to recall the influence which the National Conference on Street and Highway Safety of Washington, D. C., and the work of the National Safety Council of Chicago have played in creating an appetite for good and sufficient traffic accident statistics throughout the country. These institutions together with the auto clubs of the state, the California Committee on Public Safety, the State Chamber of Commerce, and dozens of insurance companies, have all contributed advice and assistance of inestimable value in perfecting the California system. The responsibility for the development of the system is vested with the statistician but he in turn has enjoyed the very best kind of cooperation and assistance of the officials of the California Highway Patrol and the Division of Motor Vehicles. If the system has won distinction the credit for its success is due to all of these contributing elements combined.

"Do you know a fellow down your way with one leg named Oliver?"

"I'm not sure," returned the other doubtfully.

"What's the name of the other leg?"

Auto Driver: "Have you some of that gasoline that stops knocking?"

Attendant: "Yes, sir."

Auto Driver: "Then, give my wife a glass."

Progress Report of Activities

In the

Division of Water Resources

AS OF JANUARY 1, 1931

EDWARD HYATT, Chief of Division

Flood Control
Activities



Prepare Dams
For Winter
Floods

Salinity Studies
in the Delta



Applications Filed
to Appropriate
Water

IRRIGATION, WATER STORAGE DISTRICTS

1. A conference was held with the officials of the Palo Verde Irrigation District and others interested in its welfare for the consideration of plans in furtherance of the future economic development of the district.

2. Visits were made to the El Dorado Irrigation District, located in El Dorado County, in connection with construction work in progress and to the Richvale Irrigation District, located in Butte County, in connection with the proposed water supply for that district.

3. The following matters were reported upon by the State Engineer to the California Bond Certification Commission:

Lindsay-Strathmore Irrigation District, Tulare County—Approval of contract for expenditure of \$13,500 for purchase of water stock.

Paradise Irrigation District, Butte County—Approval of an expenditure of \$2,854 for repairs of the outlet of Magalia Dam.

Richvale Irrigation District, Butte County—Approval of agreement for purchase of water rights and certain canals and laterals from the Sutter-Butte Canal Company for a consideration of \$750,000, and approval of a bond issue in the amount of \$515,090 in connection with the proposed purchase.

El Nido Irrigation District, Merced County—Approval of agreement for the purchase of water from the Merced Irrigation District.

IRRIGATION AND RECLAMATION FINANCING AND REFINANCING

A complete technical study of the methods of financing and refinancing reclamation, irrigation and other related districts in this state has been made by this Commission and a report of their findings is now being prepared in which will be incorporated recommended legislation which it is believed will assist these districts in financing and refinancing their projects on a sound basis.

DAMS

During this period the efforts of the department have been directed toward directing repairs of existing dams and enlargement of spillways prior to the winter season of high water, as well as to further inspection and study of new and old dams.

To date 733 applications for approval of existing dams have been filed, 54 applications for approval of plans for construction or enlargement, and 113 applications for approval of plans for the repair or alteration of dams.

Applications received for approval of plans for repair or alteration.

Dam	Owner	County
White Reservoir,	James M. Fitzhugh,	Modoc County.
Courtwright,	R. Anchordoguy,	Modoc County.
Chino Ranch No. 2,	W. Astley,	San Bernardino County.
Chino Ranch No. 3,	W. Astley,	San Bernardino County.
Port Costa,	Port Costa Brick Works,	Contra Costa County.
Los Serranos,	Davidson Investment Company,	San Bernardino County.
Alvord,	Riverside Water Company,	Riverside County.
Mocking Bird Canyon,	Gage Canal Company,	Riverside County.
Porter,	Pearl F. Porter,	Modoc County.
Culbertson,	Pacific Gas and Electric Company,	Placer County.
Lower Feeley,	Pacific Gas and Electric Company,	Nevada County.
Lower Lindsey,	Pacific Gas and Electric Company,	Nevada County.
Meadow Lake,	Pacific Gas and Electric Company,	Nevada County.
Middle Lindsey,	Pacific Gas and Electric Company,	Nevada County.
Rucker Lake,	Pacific Gas and Electric Company,	Nevada County.
Upper Feeley,	Pacific Gas and Electric Company,	Nevada County.
Dinger,	East Bay Municipal Utility District,	Alameda County.
Webb Flat,	Gerig Bros.,	Modoc County.
Antioch,	Town of Antioch,	Contra Costa County.

Plans approved for construction: Plans have been approved for the construction of the Peters Canyon Dam in Orange County, to be built by the Irvine Company of Tustin. This will be an earthen dam 41 feet in height with a storage capacity of 1090 acre-feet, the water stored by it to be used for irrigation.

Plans approved for repair or alteration: Fifteen such applications have been approved by the State Engineer during the period.

Order authorizing use pending formal approval was issued for the North Battle Creek Dam located in Shasta County and belonging to the Pacific Gas and Electric Company.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento and San Joaquin Drainage District: During this period only routine maintenance work has been carried on, consisting of clearing second growth timber in the by-pass, servicing the pumping plants, and other miscellaneous work. An average of twenty-five men have been employed during this period.

Flood control project maintenance—Bank protection: The construction of one tree current retard in cooperation with Reclamation District No. 70 at the Yates place, approximately four miles south of Meridian, is about one-half completed, and bank protection work at Girdner Bend, also in cooperation with this district, is well under way.

The work on Andrus Island at the Reardon ranch has been completed, with the exception of a small amount of dredger work. All other bank protection work for this season which has been definitely programmed has been completed. There is under consideration a small job in cooperation with Levee District No. 3, Glenn County, but the season is now so late it is not known whether or not this will be undertaken.

Sacramento flood control project: The work of clearing the lower Sutter-Butte Slough, and Tisdale by-passes was continued to about December 7th when the available funds were exhausted. The camp at Robbins was dismantled and moved on December 8th, and the crew at Fremont Weir housed in our floating camp was reduced to a working force of 16 men. No men were discharged by reason of discontinuing the camp at Robbins, as they were transferred to other work. The reduction in force has been made gradually by not taking on new men.

At Starr Bend on the Feather River, two openings have been made to permit the flood waters to occupy the widened flowage area, and one cut has been made in the Bear River levee for the same purpose west of the recently completed Lake of the Woods levee. This work was done directly by this office with a bulldozer hired by the hour from Le Tourneau of Stockton, who was the contractor on the Starr Bend and Lake of the Woods levees.

The deputy in charge of flood control and reclamation attended one meeting of the Reclamation Board and one meeting of the flood control construction committee.

Much detail work has been done in connection with the flood control construction program for this year, particularly as to securing rights-of-way. Plans have been prepared for most of the various construction units.

The California Debris Commission has let contract for the construction of the west levee of the Yolo By-pass, four miles in length, along Reclamation District No. 2068, the estimated cost of which is \$25,680. The Commission has also received bids for the construction of the West Yolo By-pass levee on Liberty Farms and Sullivan, Sullivan and Roche, but the contracts have not yet been let. The estimated cost of these two units is \$36,960 and \$31,640, respectively.

Emergency flood control and rectification of rivers: The bank protection work on Andrus Island in cooperation with Reclamation District No. 317 has been completed at a cost of \$21,000. This consisted of reconstructing about 3400 feet of levee and protecting it from wave wash with a quarry rock toe and blanket.

Work will be commenced about December 20th on protection of Twitchell Island, consisting of a rock facing 600 feet long.

Santa Maria River: The clearing work in the channel of the Santa Maria River near Guadalupe, in cooperation with Santa Barbara and San Luis Obispo counties, has been completed at a cost of \$7,600. Additional work at one point is contemplated, consisting of the excavation of a short channel, to cost approximately \$1,200.

Pajaro River flood control: The improvement in the channel of the Pajaro River for a length of 13,750 feet has been completed under contract with Karstedt

and Karstedt of Watsonville at a total cost of \$4,537. This work consisted of clearing a width of 60 feet and loosening the bottom material to a depth of two feet to promote erosion and channel rectification during flood.

Salinas River: No work has been done during this period on the Salinas River channel excavation, as the right to perform the work has not yet been decided by court. The dragline excavator is still on the ground and will resume work as soon as a favorable decision is rendered. This work is being done by the Division of Fish and Game.

Mokelumne River: The improvement of the flood channel of the Mokelumne River has been commenced, in cooperation with San Joaquin County. A total of \$12,500 is available for this work, one-half of which is furnished by San Joaquin County. The work is in charge of our foreman and a crew of 30 men is at work. The men in this crew work for a period of four days and are laid off four days to allow a second crew to work. In this way 60 men are provided with four day's of work each week. The work so far undertaken is clearing brush and timber.

Russian River Jetty: The recent heavy winter storms have caused some damage to the jetty on the Russian River at Jenner. The Fish and Game Commission has provided \$5,000 for the repair and maintenance of the structure and to continue the addition of rock during the winter.

Flood measurements and gages: The recording and staff gages operated by this office have been placed in condition and in operation, and preparations have been made for taking flood measurements in the various channels during the winter. An automatic tide gage has been installed in the lower Yolo By-pass at the Liberty Reclamation.

During the period November 15th to December 15th, an average of ninety-five men have been employed in the above work, exclusive of contractor's employees. Since December 10th all employees on construction and maintenance have been working on a three-day week basis, which permits us to provide half-time work for twice the number of men.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

During the month of November fifteen applications to appropriate water were received, eleven were canceled, and twenty-five approved. Twelve permits were revoked and seven licenses were issued.

Among the more important applications received were those of Humboldt Placer Mining Company to appropriate 175 second-feet from Trinity River and tributaries in Trinity County for mining purposes; Turlock and Modesto Irrigation districts to appropriate 350 second-feet and 80,000 acre-feet per annum from Tuolumne River and tributaries in Tuolumne County at an estimated cost of \$1,885,000 for power purposes; La Mesa, Lemon Grove and Spring Valley Irrigation District to appropriate 50 second-feet and 18,000 acre-feet per annum from Santa Ysabel Creek in San Diego County for municipal, irrigation and domestic purposes; and Fred J. Blakeley to appropriate 25 second-feet and 4000 acre-feet per annum from Elliott Creek in Siskiyou County for the irrigation of 6000 acres at an estimated cost of \$50,000.

Among the more important applications approved were those of East Bay Municipal Utility District to appropriate 42 second-feet and 41,436 acre-feet per annum from the San Leandro Creek and tributaries in Alameda County at an estimated cost of \$1,377,000 for

municipal purposes; Scott F. Ennis and Edward S. Brown to appropriate 60 second-feet from Sacramento River in Sutter County for the irrigation of 2482 acres at a cost of \$41,000; cities of Arcadia and Sierra Madre to appropriate a total of 6 second-feet and 4500 acre-feet per annum from Santa Anita Creek and tributaries in Los Angeles County at an estimated cost of \$80,000; Security First National Bank of Los Angeles to appropriate 6000 acre-feet per annum from Santa Anita Creek for domestic purposes at an estimated cost of \$100,000; El Sur Land and Cattle Company to appropriate 12 second-feet from Big Sur River in Monterey County for the irrigation of 1024 acres at an estimated cost of \$56,030; and Temescal Water Company to appropriate 12,000 acre-feet per annum from San Jacinto River in Riverside County for the irrigation of 5000 acres at an estimated cost of \$100,000.

ADJUDICATIONS

Shasta River (Siskiyou County)—Case pending in Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties)—case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All-American Canal from Colorado River.

North Cow Creek (Shasta County)—Referee's final report has been completed and is ready for submission to the Superior Court of Shasta County.

Oak Run Creek (Shasta County)—Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County)—Case pending in Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County)—Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County)—Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County)—The report of referee has been completed and is ready for submission to the Superior Court of Modoc County.

Mill Creek (Modoc County)—A report is in course of preparation covering the administration of the tentative schedule of allotments which was authorized for the 1930 season.

Deep Creek (Modoc County)—The report covering the field investigation of water supply and use of water made during the 1930 irrigation season is being prepared.

Franklin Creek (Modoc County)—The data collected in the field during the 1930 irrigation season is being studied and analyzed preparatory to fixing a schedule for trial distribution during the 1931 irrigation season.

WATER DISTRIBUTION

The report on water master service on North Cow Creek for the 1930 season has been completed.

Reports on water master service for the 1930 irrigation season on Davis, Emerson, Mill, Owl and Soldier creeks (Modoc County), Burney, Clover, Hat and Oak Run creeks (Shasta County), and Lower Shasta River and Little Shasta River (Siskiyou County) are in the course of preparation.

CALIFORNIA COOPERATIVE SNOW SURVEYS

Office work has included the preparation of sketch maps of newly located and relocated snow courses, revision of the key map showing all courses, and con-

tinued computations necessary in preparation for the correlation of snow survey data with run-off when the data from the surveys become available.

A field trip was made to the snow course at Lake Alpine in the Stanislaus Basin to locate a new observer. The latter will be stationed at Lake Alpine throughout the winter which will permit of monthly surveys at this location beginning in January. On the recent trip it was still possible to travel by automobile to within fourteen miles of the lake. The remainder of the trip was made on skis.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The regular field work has been completed and the work of the past month except for salinity observations and gage maintenance, has been confined to the office work in compiling the report for the 1930 season covering all diversions, stream flow, return flow, etc., throughout the Sacramento-San Joaquin territory.

Salinity investigations are being continued through the maintenance of sampling at 37 stations in the bay and delta areas. During the past month the sampling at nine stations was discontinued as the salinity at these locations had reached a constant minimum and further observations were not required. Maintenance of eight tide gages has been continued. These are located at Sacramento, Walnut Grove, Georgiana Slough, Sacramento and San Joaquin ends of Three Mile Slough, Mossdale, Antioch, and Collinsville. The following are comparative salinity data for 1929 and 1930:

Station	Salinity in Parts of Chlorine per 100,000	
	11-30-30	11-30-29
Bullhead Point	1080	1140
O and A Ferry	(1) 225	(3) 450
Collinsville	(2) 60	285
Antioch	36	255
Jersey	7	55
Emmaton	(2) 2	23
Webb Pump	5	12
	(1) November 18th	
	(2) November 26th	
	(3) November 22nd	

WATER RESOURCES

Ventura County Investigations. The progress report on Ventura County Investigations for the year 1930 was completed during the present month.

South Coastal and other Southern California Investigations: Work on the South Coastal and other miscellaneous investigations in Southern California has been continued throughout the present month.

Napa Valley Investigation: Gaging stations on Conn Creek and Napa River have been maintained during the month and readings of wells in the south-westerly and northerly parts of the valley have been repeated.

Santa Clara Investigation: The office work in connection with the Santa Clara Investigation has proceeded during the present month and the report covering work done during the past year is now being typed.

Pit River (Modoc and Lassen Counties): Routine field work was continued throughout the month. The survey of the irrigated lands was completed except for

a few disconnected areas located on small tributary streams. The survey was stopped for the season on November 20, due to weather conditions. A contour survey has been made of Essex Reservoir to determine its capacity and a water stage register installed for the purpose of securing intensity of run-off data on the area tributary to the reservoir.

WATER RESOURCES INVESTIGATIONS

The water resources investigations being carried on in the Sacramento and San Joaquin Valleys and in portions of Southern California, and the investigation of the salt water barrier and salinity conditions in the delta, in furtherance of a coordinated plan for the conservation, development and utilization of the water resources of this State, as provided in Chapter 832 of the Statutes of 1929, are now drawing to completion and practically the entire staff engaged in this work has been concentrated upon the preparation of reports covering the results of the investigations made by the Division of Water Resources.

The bulletins of the Division of Water Resources to be prepared and published covering the results of the investigations made are twelve in number as follows:

- (1) Bulletin 25—Report to the Legislature of 1931 on State Water Plan.
- (2) Bulletin 26—Sacramento River Basin.
- (3) Bulletin 27—Salinity Control in Sacramento-San Joaquin Delta and Upper San Francisco Bay.
- (4) Bulletin 28—Economic Aspects of a Salt Water Barrier Below Confluence of Sacramento and San Joaquin Rivers.
- (5) Bulletin 29—San Joaquin River Basin.
- (6) Bulletin 30—The Pacific Slope of Southern California.
- (7) Bulletin 31—Santa Ana River Basin.
- (8) Bulletin 32—South Coastal Basin.
- (9) Bulletin 33—Rainfall Penetration and Consumptive Use of Water in Santa Ana River Valley and Coastal Plain.
- (10) Bulletin 34—Permissible Annual Charges for Irrigation Water in Upper San Joaquin Valley.
- (11) Bulletin 35—Permissible Economic Rate of Irrigation Development in California.
- (12) Bulletin 36—Cost of Irrigation water in California.

REPORT OF DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

LICENSE RENEWAL PERIOD IS ON

On December 15th, the Division counters were opened to the public for the distribution of 1931 license plates. New offices were opened at Pasadena, San Bernardino, San Jose and Stockton.

REGISTRATION FIGURES

As of December 1st, the Division has registered 1,929,428 automobiles, 15,476 solid tire trucks, 82,816 pneumatic tire trucks, 9,326 motorcycles, 9,543

solid tire trailers, and 38,658 pneumatic tire trailers, making a total of 2,085,247 fee paid registrations. In addition to the fee paid registrations exempt license plates have been issued to 32,361 automobiles, 911 motorcycles and 3,961 trailers, or a total of 37,233 exempt cars have been registered. The total fee paid and exempt registrations as of December 1st, is 2,122,480.

LIGHT AND BRAKE ENFORCEMENT ACTIVITIES

The Inspector in charge of the Bureau of Lights and the California Highway Patrol has continued the drive against glaring headlights as well as vehicles with one headlight and no taillight. We feel that a great benefit has been derived from the work done so far. An extensive program has been outlined for this work which will be followed as closely as possible.

The Bureau of Brakes report a substantial number of cars tested last month. The Inspector in charge with the Attorney for the Division has spent much time in preparing data for the Motor Vehicles Conference meetings. Three meetings of the Conference have been held to date and some very valuable information has been obtained.

REPORT OF DIVISION OF ARCHITECTURE

GEORGE B. McDOUGALL, Chief

During the month of December, 1930, contracts totaling \$247,745 were awarded. These contracts included work at the following institutions:

Stockton State Hospital.
San Jose State Teachers College.
Preston School of Industry.
Patton State Hospital.
San Diego Teachers College.
Agnews State Hospital.

Right of Way Agents Receive Appointments

Appointments of right of way agents for the Division of Highways have been announced as follows:

San Francisco—John Howard, Herbert Forbes, Frank F. Webb, Halloway Jones, and Jay J. Herz.

Eureka—Philip C. Eastman.
Redding—Leland L. Rose.

Los Angeles—Adolph N. Sutro.

Sacramento—Charles S. Smith, Bradford Perry, George Pulich, and Louis Malatesta.

San Bernardino—J. A. Gregory and Charles L. Flack

Fresno—Henry Sellers.

Lady: "Doctor, I want to reduce. What exercises should I take?"

Doctor: "Push yourself away from the table three times a day."

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED,
AS OF JANUARY 1, 1931—OTHER ACTIVITIES OF DEPARTMENT

C. H. PURCELL, Chief of Division of Highways.

DECEMBER AWARDS

During December, 1930, contracts were awarded and work advertised as follows:

Work placed under contract-----	\$1,111,100
Contracts pending and work advertised	\$96,600

Total -----	\$2,007,700
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Unemployment Activities

Reports as of Saturday, December 20, 1930, shows that the program for unemployed relief upon the state highway system is affording employment to 3107 men who otherwise would be without work.

On that day 1732 men were at work on relief maintenance crews working out from over 200 centers in California. These men are working upon a three-day-a-week basis and are paid \$4 per day. They provide their own board and lodging, and are organized in addition to the regular maintenance organization.

In order to afford relief to unemployed labor in the metropolitan areas of California five labor camps have been established and are now carrying their full quota of 250 men each. These camps are respectively located in Plumas County on the Feather River lateral; on the alternate ridge route and on the Arroyo Seco Highway in Los Angeles County; on the Yosemite lateral in Mariposa County and on the Carmel-San Simeon Highway in Monterey County. A special relief construction crew of 125 men is working on the latter highway south of Monterey.

The men employed in labor camps are selected by the state free employment agencies and are again selected on the basis of their great need for labor and ability to qualify as bona fide residents of California. They are paid \$3 a day and provided with board and lodging. The special construction crew working out of Monterey and Carmel provide their own board and lodging.

COMPLETED CONTRACTS

Contracts were completed during December on the following important projects:

Rose Canyon Work

In San Diego County five and one-half miles of Portland cement concrete pavement, 30 feet wide, have been placed, through Rose Canyon, on the recently graded roadbed over the new alignment of that portion of the main route between San Diego and Los Angeles from Balboa Ave. to Torrey Pines Road, within the city limits of San Diego. This new route

is an improvement over the old road, via La Jolla, shortening the highway between Los Angeles and San Diego by some $4\frac{1}{2}$ miles. As a unit of this rerouting of the state highway was the construction of a reinforced concrete girder bridge, 210 feet long, completed last June. The cost of this new route, including the grading, paving and construction of the bridge, amounted to \$319,500.

San Bernardino-El Centro Lateral

A contract has just been completed for constructing uniform 8 foot shoulders along each side of the existing 20 foot concrete pavement over the six miles between the San Bernardino County line and one mile west of Beaumont in Riverside County. Construction on this route, carrying much heavy produce-trucking from the fertile Imperial Valley, as well as a large portion of transcontinental tourist traffic entering Southern California, is being pushed forward to modern standards as rapidly as possible. Besides the contract just completed in Riverside County, the 13 miles between Arroyo Salado and the northerly county line in Imperial County are now under construction, a 20 foot asphalt concrete pavement being placed on a 36 foot graded roadbed. Also a project was advertised for bids on December 23d, which calls for placing a 20-foot asphalt concrete pavement over the existing 16-foot Portland cement concrete pavement and grading the roadbed to a full 36-foot width between Trifolium Canal and Kane Springs in Imperial County. The cost of the widening in Riverside County amounted to \$41,100, and the proposed six miles of paving between the Trifolium Canal and Kane Springs is estimated to cost \$185,000.

Redwood Highway

Progress on the new alignment of that portion of the Redwood Highway between San Rafael and Sausalito in Marin County is noted by the completion of the contract for placing a 30-foot bituminous macadam pavement on the recently constructed roadbed from San Rafael to Alto. Another unit of this work to be completed during the past month was the erection of a bascule span and 855 feet of timber trestle across the tide lands near the mouth of Corte Madera Creek at Greenbrae, the bascule span crossing the navigable channel of the creek. This bridge has a clear roadway width of 44 feet and a 5-foot sidewalk. The southerly sector of this rerouting of the Redwood Highway is now under construction between Alto and Waldo, where it will connect with the existing road. Bids were opened on November 26th for the construction of a bridge across the tracks of the Northwestern Pacific railroad and an arm of Richardson's Bay at Manzanita within the limits of this southerly section. This structure will consist of 2340 feet of timber trestle on pile and frame bents with a 56-foot plate

girder lift span on concrete piers with pile foundations and a 45-foot steel stringer span on concrete bents with pile foundations. This structure also will have a 44-foot roadway. Upon its completion the highway over this new alignment will materially shorten the distance between Sausalito and San Rafael and will also eliminate from the route the dangerous Corte Madera grade. The cost of the surfacing between Alto and San Rafael amounted to \$95,600 and the Corte Madera Creek bridge was erected at a cost of \$170,000. The Manzanita bridge will cost \$346,150.

Cosumnes River Bridge

A timber bridge across the Cosumnes River connecting Amador and El Dorado counties has been completed as a unit of the construction of the historic Mother Lode Highway through the heart of early California mining districts. This new structure cost \$23,000 and was built on a straightened alignment at this river crossing, replacing the old light steel bridge with its serpentine approaches which was erected by the counties in 1895.

Victory Highway

Further progress on the reconstruction of the Sacramento to Reno road via Auburn is noted by the completion of nine and one-half miles of grading on new alignment between the airport at Emigrant Gap and Indian Springs in Placer and Nevada Counties. This new alignment is a great improvement, both as to line and grade, over the old road. Two grade separations, an underpass at Emigrant Gap and an overhead at Yuba Pass, which will eliminate the dangerous Emigrant Gap and Crystal Lakes grade crossings, are now under construction. Surfacing over this section has already begun and has been completed from the South Fork of the Yuba River over the 11 miles to Soda Springs, easterly from the grading project just completed. The cost of the completed grading and surfacing contract was \$605,800. The improvement of this highway is of great interest to thousands of California motorists who seek their recreation in the many vacation spots around Lake Tahoe and in the high Sierra, as well as to the many transcontinental tourists who enter California by this beautiful mountain highway.

Valley Route

Reparing of the Los Angeles to Sacramento highway north of Stockton is rapidly progressing. During the past four weeks seven miles of Portland cement concrete pavement twenty feet wide with eight foot shoulders between Stockton and Lodi have been completed and accepted, from Cherokee Station to Harney Lane between Stockton and Lodi. This pavement cost \$278,600, and replaces the old 16-foot bituminous macadam pavement which was built by the county. At a cost of \$63,500, a 20-foot asphalt concrete pavement was placed between Forest Lake and the San Joaquin-Sacramento county line and work is nearing completion on the paving from Houston School to Forest Lake north of Lodi.

BIDS RECEIVED

Projects upon which bids have been received since November 24th include the following:

Yuma Highway

In Imperial County an asphalt concrete pavement twenty feet wide is to be placed over the six miles from Yuma to Araz. This project will be the improvement of the most southerly highway entrance into California. Construction on this transconti-

ental highway will begin at the Colorado River bridge at Yuma. The new pavement is to be placed on a gravel subbase which will raise the grade of the highway sufficiently to give proper and adequate drainage. The cost of the improvement will be \$245,000.

Coast Route

Two projects of prime importance to the improvement of the heavily traveled Coast Route connecting Los Angeles and San Francisco will be the following: The one, in Santa Barbara County, calls for the construction of a graded roadbed and the placing of a 20-foot Portland cement concrete pavement over three miles of this road as it passes through the Gaviota Canyon. The project will extend from Gaviota Station to Las Cruces, and will cost \$231,700. The existing sharp curves and adverse grades through the canyon are to be reconstructed to modern standards of highway alignment. To accomplish this end much heavy grading along the canyon walls will be necessary. Under a separate contract a reinforced concrete arch bridge will be constructed at a crossing of Gaviota Creek.

The other project comprises the grading and paving of eleven miles of the Coast Route in San Luis Obispo County from Paso Robles to the Monterey County line. In this instance the pavement will be asphalt concrete, and portions will be placed over the existing 15-foot Portland cement concrete pavement. The new pavement is to be placed with a "one-way crown" so that future widening may be done on the west side away from the tracks of the Southern Pacific Railroad which parallel the highway. The cost of the grading and paving of this project is \$290,200.

Pacheco Pass Lateral

In Santa Clara County nearly eleven miles of the Pacheco Pass lateral are to be reconstructed from San Felipe to one mile east of Bell's station. The present improvement will involve the placing of a 20-foot bituminous macadam pavement, with eight foot shoulders, on an improved alignment and grade. This lateral, connecting as it does the Valley Route at Califa with the Coast Road at Gilroy, carries a rapidly increasing amount of traffic, especially high speed commercial trucking, and this work is so designed that the road may better care for the travel it is called upon to bear. The improvement is estimated to cost \$245,000.

Feather River Lateral

A project of the first magnitude will be the erection of a steel cantilever bridge across the North Fork of the Feather River at Pulga in Butte County. The work of placing the concrete piers and abutments is under way, and bids for the erection of the steel superstructure were opened on the 3d day of December. The deck of the highway bridge will be 170 feet above high water and 130 feet above the top of the Western Pacific Railroad bridge which passes diagonally under the State's proposed structure. The project for the substructure calls for placing two reinforced concrete abutments and two reinforced concrete piers. The erection of the superstructure will include one 350-foot steel arch span, two 62-foot plate girder spans, and one 44-foot plate girder span. The roadway width of the bridge will be 24 feet. At a cost of \$181,700 another link will be added to this new all year highway to Quincy and to Plumas County.

Her: "Was that your new girl I saw you with last night?"

He: "No, just the old one painted over."

Civilization Moulded By Highways

By LEO G. LAUCK, Economist, Washington, D. C.*

NO OTHER movement is more closely related to many phases of present-day civilization than that of highway development and transportation. It touches the life, directly and indirectly, of every man, woman and child throughout the universe. It has many angles—social, economic and financial.

The real movement for expansion is of comparatively recent origin. It came with the advent of the automobile and the motor truck. Originally the speed of the horse was the measuring rod by which the roads of the past were developed. Today the speed of the automobile and the weight of the motor truck have become the gauge on which development must proceed.

Just as the various countries were unprepared for participation in a World War, so they were unprepared for the Aladdin-like spread of the automobile to every corner of the world. Motor development, with its rapid strides in the space of the past ten years, has run far ahead of highway development, and the world is now straining to catch up.

In spite of the fact that the Romans, almost two thousand years ago, built some roads that still exist; that Napoleon gave not only his code but many hundreds of kilometers of excellent roads to France, and that there are many other scattered examples of good road building, highway development as a science and as a fact has made greater advances in the past thirty years or less than in all previous history.

Invention has made the highways of the past as useless to modern civilization as a coat of armor would be to the present-day soldier. Pioneer highway engineers would all have changed their predictions with regard to the lines of commercial and industrial development which their respective countries would take if they could have looked forward a few years to the invention of the steam engine, or still further to the coming of the automobile and the motor truck, supplementing, as they do, the railway in the commercial and social life of the world.

People everywhere have become impatient of restraint and adventurous in spirit, and as a consequence industrialization and standardization have shown rapid progress

throughout the world. They have their values, but they are prison bars to one phase of the modern temperament. The automobile has furnished the release.

This fact is emphasized most vividly by a survey of the world's highways recently prepared by the United States Department of Commerce. It discloses a total of 7,805,629 miles of roads distributed by continents as follows: America, 3,727,393; Europe, 2,450,439; Asia, 1,014,014; Australia and Oceania, 350,863, and Africa, 262,920 miles.

The United States, not including Alaska and the outlying possessions, has the greatest actual mileage of highways, with 3,016,281, or 38.7 per cent of the world total. Russia ranks second with 776,712 miles and is followed by Japan with 575,325 miles; France, 405,028 miles; Canada, 381,977 miles; Australia, 300,000 miles; India, 283,506 miles; Germany, 216,672 miles; United Kingdom, 179,095 miles, and Poland, 139,631 miles.

The fairest basis on which to compare highway mileage seems to be the proportion of road mileage to area. One country large in area may have a greater road mileage than a smaller country and yet be less adequately provided with roads it needs. Considering the area and total mileage, Japan leads the world with three miles of road to the square mile, followed by Luxemburg with 2.6; Northern Ireland, 2.5; United Kingdom, 2; Denmark, 1.9; France, 1.89; Irish Free State, 1.75; Belgium, 1.43; Lithuania, 1.28; Germany, 1.19; Netherlands, 1.18; Hungary, 1.05; and the United States in twelfth place with 1 mile of road to the square mile of area.

As the population of the world continues to grow in number and as further development of industry results in increased production, the demand for more roads is certain to increase still further. It is up to the individual countries to meet that increase. During the past few years individual effort nearly everywhere has kept pace with the increased demand for additional highways; yet their capabilities have scarcely been tried.

As the ancients believed the roads lead to a liberal education, so the governments of this great world of ours have rested conclusively in their upward progress upon the slender path of the aborigine, swelled to the well defined trail of the caravan, broadened into the cart and wagon road, all to be supplanted by a vast network of macadam, concrete and brick. What will follow it? Time alone can tell.

Definition: A pedestrian is a man looking for the place where he parked his car.—*Life*.

* Re-published from the Highway Magazine.

STATE HIGHWAY BUDGET FOR 1931-1933 BIENNIUM PRE- SENTED TO STATE LEGISLATURE

(Continued from page 8.)

Grading, structures, pavement and oiled shoulders, Turner's Station to Stockton (San Joaquin County), \$319,400. This provides for the improvement of the so-called "Hogan" Road from Stockton south.

Nine timber bridges (San Joaquin County), \$95,600.

Grading, filling borrow pits, pavement and structures, Cosumnes River bridge to 1.4 miles north of McConnell (Sacramento County), \$26,600.

McConnell grade separation, subway (Sacramento County), state's share, \$66,500.

Stanislaus River Bridge and approaches (Stanislaus County), \$105,300.

Grading and structures, 5.3 miles, Canton Creek to Piru Creek, Ridge Route Alternate (Los Angeles County), \$500,000.

Grading and structures, 3.9 miles, Los Alamos Divide, Ridge Route Alternate (Los Angeles County), \$1,000,000. This item and the one immediately above provides for continuation of construction upon the Alternate Ridge Route.

Grading, structures, pavement, 3.1 miles, Fresno to Fancher Creek (Fresno County), \$216,200. This completes the widening of pavement immediately north of the city of Fresno.

Grading, oil rock shoulder, 29.8 miles, Bakersfield to Grapevine (Kern County), \$360,000. This widens the roadbed and improves conditions upon the "seventeen mile tangent."

Grading and resurfacing, 11.8 miles, Goshen to Kingsburg (Tulare County), \$473,000. This provides for widening the 15-foot pavement in Tulare County.

Five bridges over Cross Creek, widening; bridge over canal near Traver (Tulare County), \$60,000.

Grading, structures, oil shoulders, pavement, 5.5 miles, Plaza Garage to Goshen; grading, structures, oil shoulders, Plaza Garage to 0.3 of a mile westerly (Tulare County), \$272,000. This with other work will complete the widening of the 15-foot pavement in Tulare County and provide a grade separation at the junction of the Golden State Highway and the Hanford lateral.

Plaza Garage grade separation (subway) Tulare County, state's share, \$50,000.

Grading, structures, oil shoulders, pavement 2.9 miles, Union avenue to Beardsley Canal (Kern County), \$236,000. This provides for improving and widening pavement at the north city limits of Bakersfield.

Bridge over Kern River (Kern County), \$400,000.

Bridge over Beardsley Canal (Kern County), \$16,000.

COAST HIGHWAY

(San Francisco to San Diego)

Grade separation with S. P. tracks at Madrone (Santa Clara County), state's share, \$110,000.

Soledad Grade separation and approaches (Monterey County), \$96,000.

Bridge over San Benito River (San Benito County), \$140,000.

Santa Clara River bridge (Ventura County), \$410,000. The original was washed out by the flood following the failure of the San Francisquito Dam. The new bridge is on new alignment, and is an improved structure.

Grading, structures, widening pavement, Fullerton to Los Angeles County line (Orange County), \$164,500. This will complete the 30-foot width of pavement on the Coast Highway between Los Angeles and Santa Ana.

Grading, surfacing and structures, 3.9 miles, Wigmore, to Los Alamos (Santa Barbara County), \$150,000. This provides for widening the existing 15-foot pavement.

Repairing floor, Santa Ynez River bridge at Buelton (Santa Barbara County), \$18,000.

Grading, pavement, structures, widening, 5.1 miles, Serra to San Diego County line (Orange County), \$382,500. This project increases the present 20-foot pavement to 30 feet in the southern part of Orange County between the junction of the Coast Highway and the Oxnard-Capistrano Highway.

Grading, structures, pavement, widening 4.5 miles, Ventura to El Rio (Ventura County), \$100,000. This provides for a 30-foot pavement south of Ventura to the junction of the Coast Highway and the Oxnard-Capistrano Highway.

Bridge and approaches, San Dieguito River bridge (San Diego County), \$224,500. This corrects alignment and substitutes an improved bridge for the present trestle.

Grading, structures, pavement, 16.8 miles, Santa Rita to San Benito River, 16.8 miles (Monterey and San Benito counties), \$1,046,700. This provides for grading and paving of the relocated San Juan grade.

Bridge over San Juan Creek (San Benito County), \$10,000.

VICTORY HIGHWAY

(Roseville to Nevada Line via Auburn)

Grading, pavement and small structures, 4 miles, Newcastle to Auburn (Placer County), \$335,000. This project provides for correction of alignment and widening of 15-foot pavement.

Oil rock surfacing, Airport to Soda Springs, 20 miles (Placer and Nevada counties), \$93,000.

Oil rock surfacing, Colfax to Gold Run, 8.9 miles (Placer County), \$125,000.

Grading, structures, oil rock surfacing, Gold Run to Airport, 12 miles (Placer County), \$780,000. This completes the remaining unimproved section east of Auburn.

Towle Grade separation (subway beneath S. P. tracks) (Placer County), state's share, \$20,000.

Oil rock surfacing 1.8 miles near Bay View Rest (El Dorado County), \$7,200.

Myers to Nevada Line via Truckee River

Oil rock surfacing, Tahoe Junction to Hinton, 9 miles (Nevada County), \$135,000.

Oil surfacing, Bay View, northerly, 1.8 miles (El Dorado County), \$7,200.

TAHOE-UKIAH HIGHWAY

Armor top surface, Nevada City to Washington Road, 11.8 Miles (Nevada County), \$41,000.

Bridge over Russian River (Mendocino County), \$30,000.

PLACERVILLE-TAHOE HIGHWAY

(Sacramento to Nevada Line via Placerville)

Grading and structures from Brighton to Mills (Sacramento County), \$339,000. This provides for placing a concrete pavement on the first section of the Placerville road from Sacramento easterly.

Grading, structures, paving in Placerville (El Dorado County), \$40,000. (Cooperative project.)

Oil rock surfacing Riverton to Kyburz, Strawberry to Phillips (El Dorado County), \$51,200.

Oil rock surfacing, Mays to state line (El Dorado County), \$50,200.

Grading, structures, oil rock surfacing, Placerville to RR Xing (El Dorado County), \$59,000. This provides for grading and surfacing a section of the road immediately east of Placerville hitherto unimproved except for maintenance.

Oil surfacing, Clarks Corner to Placerville, 1.7 miles (El Dorado County), \$5,450.

MOTHER LODE HIGHWAY

(Auburn to Sonora)

Grading, structures, armor top surfacing 1.2 miles, San Andreas to 1.4 miles north of Calaveritas Creek (Calaveras County), \$35,000.

Armor top surfacing north and south of Calaveritas Creek, 2.9 miles (Calaveras County), \$13,300.

Armor top surfacing, 7.2 miles, Dry Town to Martell (Amador County), \$29,500.

FEATHER RIVER LATERAL

(From Pacific Highway to Quincy via Oroville)

Grading, structures and oil rock surface from Pulga to East Butte County line (Butte County), \$483,400. This continues construction on the Feather River lateral from the crossing at Pulga east to the Plumas County line.

Bardees Bar bridge (Butte County), \$41,000.

Grading, structures and oil rock surfacing 1.2 miles, Spanish Creek to Keddie (Plumas County), \$135,000.

Spanish Creek and W. P. tunnel, bridge and portal structures (Plumas County), \$100,000.

Bridge over West Branch Creek (Butte County), \$45,000.

Oiled surface, Oroville to Feather River, 4.1 miles (Butte County), \$16,600.

TRINITY LATERAL

(Redding to Arcata via Weaverville)

Oiled surface, Weaverville to Tower House, 32 miles (Trinity and Shasta counties), \$69,100.

Clear Creek bridge approaches (Shasta County), \$9,300.

Bridge at Browns Creek and approaches (Trinity County), \$9,700.

Bridge at Clear Creek (Shasta County), \$17,700.

Oil rock surfacing, 9 miles, Humboldt Creek to Willow Creek (Humboldt County), \$58,500.

DOWNIEVILLE LATERAL

(Nevada City to Downieville)

Grading, structures and surfacing, Nevada City to Downieville (Nevada, Yuba and Sierra counties), \$50,000. This starts the redevelopment and widening of the old highway originally built by convicts on standards not satisfactory for present traffic.

ALTURAS LATERAL

(Redding to Nevada Line via Alturas)

Oiled surface, Fall River to Hot Creek, 66 miles (Shasta, Lassen and Modoc counties), \$243,600.

Oiled rock surfacing, Diddy Hill to Old Round Mountain, 8.7 miles (Shasta County), \$115,000.

Oiled surface, 3 miles east of Alturas to railroad crossing, 1.4 miles (Modoc County), \$5,000.

Oiled rock surfacing, Main Street to East City Limits of Alturas (Modoc County), \$5,500.

RED BLUFF-SUSANVILLE LATERAL

(Red Bluff to Nevada Line near Purdy's via Susanville)

Oiled surfacing, Mineral to Chester, 31 miles (Tehama and Plumas counties), \$55,600.

Oiled surfacing, Westwood to Willards, 12.8 miles (Lassen County), \$32,000.

Grading, oil rock surfacing, structures, 9.2 miles, Willards to Susanville (Lassen County), \$296,800. This provides for reconstructing and improving a section that is difficult both of maintenance and snow removal.

Oiled rock surfacing from 2 miles east of Dales to Paynes Creek, 7.3 miles (Tehama County), \$96,700.

Oil rock surfacing, 11.4 miles, Lake Almanor to Westwood (Lassen and Plumas counties), \$97,700.

Oil surfacing, Doyle to Long Valley Creek, 7.5 miles (Lassen County), \$18,800.

KLAMATH RIVER LATERAL

(Redwood Highway near Klamath River to Pacific Highway)

Walker bridge and approaches (Siskiyou County). Cooperative project, state's share, \$19,000.

Beaver Creek bridge and approaches (Siskiyou County), \$48,300.

Grading and bridge replacements, Weitchpec to Happy Camp, \$165,000 (Siskiyou and Humboldt counties).

UKIAH TO MENDOCINO STATE HOSPITAL

Bridge over Russian River (Mendocino County), \$30,000.

BAYSHORE HIGHWAY

(San Francisco to San Jose)

Bituminous macadam pavement from Fifth Avenue, San Mateo to Willows Road, 11.4 miles (San Mateo County), \$315,200.

Grading, structures and bituminous macadam pavement, 9.3 miles, Willow Road to Alviso Road (San Mateo and Santa Clara counties), \$716,850.

Bridge over San Francisquito and Stevens Creek, \$65,000.

Concrete pavement, Broadway to Fifth Ave., 3 miles (San Mateo County), \$272,450.

These projects continue present pavement activities to San Mateo and provide for construction and surfacing of the remaining sections of the road to a connection with the Alviso Road, 6 miles from San Jose.

SKYLINE BOULEVARD

(San Francisco to Glenwood)

Grading, structures and bituminous macadam, Saratoga Gap to Black Road, portions, 4 miles, (Santa Clara and Santa Cruz counties), \$300,000. This continues the construction of the Skyline Boulevard southerly.

SACRAMENTO-OAKLAND HIGHWAY

Grading, pavement, structures and oil shoulders, 1.7 miles west of Cordelia to 1.7 miles west of Fairfield (Solano County), \$294,600. This will eliminate the last piece of 15-foot pavement existing on this highway.

Bridges over Ledwood, Suisun and Knightson creeks (Solano County), \$25,000.

Filling borrow pits, pavement, and oil shoulders, 1.3 miles, west of causeway (Yolo County), \$70,000.

ALBANY TO MARTINEZ

Grading, structures and pavement, San Pablo Creek to Crockett, excepting Phiole; "A" Street subway, Crockett (Contra Costa County), \$396,000. This project provides for a 30-foot asphaltic and concrete pavement on the existing macadam highway between Richmond and Crockett.

STOCKTON TO SANTA CRUZ VIA OAKLAND

Grading, structures and pavement, Castro Valley Road (Alameda County), \$50,000.

Grading, armor top surface, structures, French Camp via McKinley Avenue to Stockton (San Joaquin County), \$50,000. This completes the improvement of the south approach to Stockton through Altamont Pass.

Bridges, over Homestead Canal and Walker Slough (San Joaquin County), \$16,500.

Grading, structures, pavement and shoulders, 5 miles, Greenville to Livermore (Alameda County), \$166,100. This project constitutes an improvement of the westerly side of the Altamont Pass.

Grading, structures, pavement, shoulders, 3.5 miles, Meridian Road to Ware Avenue (Santa Clara County), \$70,000. This will correct reverse curves near Johnson's Corner south of San Jose.

Grading, structures, surfacing (Santa Cruz County), Santa Cruz to 1 mile west, \$60,000.

Grading, structures, surfacing, 6.5 miles, Inspiration Point to Vine Hill Road, portions (Santa Cruz County), \$360,000. This with the item immediately preceding constitutes the first unit in the relocation of the present highway congested Los Gatos-Santa Cruz highway.

SALIDA TO ROUTE 23 AT JUNCTION

(Salida on Valley Route North of Lodi, Through Sonora, Over Sonora Pass to Junction north of Bridgeport)

Grading, armor top surface, structures, Sonora to one-half mile east (Tuolumne County), \$27,400.

Grading, structures, and oil rock surfacing, Long Barn to Stoddard Springs (Tuolumne County), \$97,000 (note an additional \$30,000 will be spent on this section from Forest Highway Funds). This continues the improvement from the end of the surfaced road at Long Barn.

SAN ANDREAS LATERAL

(From Golden State Highway, Valley Route, Near Lodi to Route 23, Near Silver Creek, Calaveras County)

Grading, structures and surfacing, 7.1 miles, Waterloo Road to 1.3 miles east of Clements (San Joaquin County), \$213,000. This project provides for the pavement of the present county built macadam east of Lodi, taken over by the state when the road was admitted into the state system.

Grading, structures, oil rock surfacing, Big Trees to Dorrington, 3 miles (Calaveras County), \$104,000. (This is a cooperative project and \$36,000 of Forest Highway funds will be added to the state construction of \$104,000.)

Grading, structures, surfacing near Lake Alpine, 5 miles, portions (Alpine County), \$50,000.

MANTECA TO ROUTE 5**NEAR MOSSDALE SCHOOL**

Grading, pavement and structures, 4.2 miles, Mossdale to Manteca (San Joaquin County), \$174,000.

Grade separation, underpass, Western Pacific RR. (San Joaquin County), state's share, \$30,000.

This provides for paving the remaining unpaved portion of the road with a grade separation structure beneath the tracks of the Western Pacific tracks.

PACHECO PASS LATERAL

(Califa, on the Valley Highway to Gilroy on the Coast)

Three timber bridges with approaches over High-

line Canal and San Joaquin overflow (Merced County), \$51,500.

REDWOOD PARK ROAD

(Saratoga Gap Near Redwood Park to Blooms Mill)

Grading, structures and armor top surfacing, 3.6 miles, Saratoga Gap to Waterman Switch (Santa Cruz County), \$271,600. This completes the grading to a connection with the improved county road in San Lorenzo Canyon.

SAN LUCAS TO SEQUOIA NATIONAL PARK

Grading, structures and 20-foot bituminous macadam pavement from 1 mile west of Merryman to 3 miles east of Lemon Cove, 10.4 miles (Tulare County), \$350,000. This constitutes an improvement of the present unsatisfactory county paved road which was taken over by the state when this road was admitted into the state system.

Grading and oil shoulders west of Plaza Garage to county line, 3.5 miles (Tulare County), \$12,000.

CARMEL-SAN SIMEON HIGHWAY

Grading, structures and oil rock surfacing, 5.4 miles, San Remo Divide to Carmel (Monterey County), \$214,000.

Bridge over Carmel River, San Jose and Wild Cat Canyon Creeks (Monterey County), \$85,000.

Bridge over Granite Creek (Monterey County), \$45,000.

Bridge over Garrapata Creek (Monterey County), \$35,900.

Grading, structures and oil rock surfacing, 8.6 miles, Cambria to San Simeon (San Luis Obispo County), \$210,000. This completes the present state highway at southerly end connecting with convict construction to the north. These projects will complete the grading and surfacing of the highway with the exception of a 25 mile gap between convict camps.

Bridge over San Simeon Creek, Pico Creek, Little Pico Creek, near San Simeon (San Luis Obispo County), \$90,000.

EAST OF SIERRA HIGHWAY

(Saugus to Route 11 at Alpine Junction)

Grading, structures and oil rock surfacing, Yerbys to McGee Creek, 7.3 miles (Mono County), \$243,600.

Grading, structures and oil rock surfacing, Convict Creek to Casa Diablo Hot Springs, 5.5 miles (Mono County), \$120,450.

Grading, structures and oil rock surfacing, Casa Diablo Hot Springs to Deadman Creek, 8.8 miles (Mono County), \$234,950.

Grading and structures from 1 mile north of Bridgeport to Sonora Pass Junction, 15 miles (Mono County), \$261,000.

Bridge over Walker River (Mono County), \$15,000.

All of these projects are in Mono County and located north of Bishop.

EL RIO TO SAN JUAN CAPISTRANO

(Portion of the Coast Route)

Grading, structures and pavement, 7.4 miles, Los Flores Canyon to Santa Monica (Los Angeles County), \$510,200. This provides for widening pavement to 40 feet.

Widening pavement, Topanga Canyon to Los Flores Canyon, 3.2 miles (Los Angeles County), \$50,000.

Santa Ana River bridge, widening (Orange County), \$80,000.

Shore protection, Santa Monica to Pt. Mugu, 7.2 miles (Los Angeles and Ventura counties), \$240,000.

diverted in Sec. 6, T. 17 S., R. 6 E., S. B. B. and M., for recreational purposes.

TRINITY COUNTY—Application 6846. Grunman and Slack, c/o Chas. A. Slack, Tracy, California, for 10,00 c.f.s. from Little Boulder Creek tributary to Coffee Creek and Trinity River to be diverted in Sec. 14 or 22, T. 37 N., R. 8 W., H. B. and M., for placer mining purposes.

COLUSA COUNTY—Application 6847. Mary E. Porter Gleason, c/o Rutledge and Rutledge, attorneys, Colusa, California, for 1.92 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 7, T. 14 N., R. 1 E., M. D. B. and M., for irrigation purposes on 173.58 acres. Estimated cost \$2,515.00.

RIVERSIDE COUNTY—Application 6848. Grace L. Williams, Lake Arrowhead, California, for 1½ gallons per minute from unnamed spring tributary to San Joaquin River watershed to be diverted in Sec. 2, T. 6 S., R. 2 E., S. B. B. and M., for domestic purposes. Estimated cost \$250.00.

HUMBOLDT COUNTY—Application 6849. Salyer Consolidated Mines Co., Salyer, Trinity Co., California, for (a) 25, (b) 10 and (c) 15 c.f.s. from (a) Campbell Creek, (b) Four Mile Creek and (c) Martin Creek including all intercepted water along the line of the conduit tributary to (a) and (b) South Fork of Trinity River and (c) Trinity River to be diverted in Sec. (a) and (b) 20, T. 6 N., R. 5 E., H. B. and M., (c) Sec. 16, T. 6 N., R. 5 E., H. B. and M., for Mining purposes. Estimated cost \$200,000.00.

HUMBOLDT COUNTY—Application 6850. Geo. H. Bergin, Weaverville, California, for 125 c.f.s. from Horse Linto Creek tributary to Trinity River to be diverted in Sec. 15, T. 7 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$200,000.00.

EL DORADO COUNTY—Application 6851. John J. Scherrer, box K, Placerville, California, for 0.05 c.f.s. from unnamed stream tributary to Hangtown Creek to be diverted in Sec. 18, T. 10 N., R. 11 E., M. D. B. and M., for domestic and irrigation purposes (0.5 acres).

SAN BERNARDINO COUNTY—Application 6852. Robert M. Stapp, P. O. box 5, Lake Arrowhead, California, for 0.008 c.f.s. from unnamed spring tributary to Burnt Mill Canyon and Little Bear Creek to be diverted in Sec. 28, T. 2 N., R. 3 W., S. B. B. and M., for domestic and recreational purposes. Estimated cost \$200.00.

TRINITY COUNTY—Application 6853. W. E. Campbell, c/o J. Emerson Gee, 211 South Berendo St., Los Angeles, California, for 100 c.f.s. from Canyon Creek tributary to Trinity River to be diverted in Sec. 17, T. 35 N., R. 10 W., M. D. B. and M., for hydraulic mining purposes.

MENDOCINO COUNTY—Application 6854. C. D. & Anna D. Flowers, c/o Hale McCowen, Jr., attorney, Ukiah, California, for 0.50 c.f.s. from Russian River tributary to Pacific Ocean to be diverted in Sec. 4, (projected) T. 14 N., R. 12 W., M. D. B. and M., (in Lot 66, Yokayo Rancho) for irrigation purposes (24 acres). Estimated cost \$2,800.00.

MENDOCINO COUNTY—Application 6855. J. C. Crawford, c/o Hale McCowen, attorney, Ukiah, California, for 0.60 c.f.s. from Russian River tributary to Pacific Ocean to be diverted in Sec. 4, (projected) T. 14 N., R. 12 W., M. D. B. and M., (in Lot 66, Yokayo Rancho) for irrigation purposes (52 acres). Estimated cost \$2,800.00.

SAN BERNARDINO COUNTY—Application 6856. John L. McKee, Twenty-nine Palms, California, for 15 gallons per minute from Surprise Springs to be diverted in Sec. 15, T. 3 N., R. 7 E., M. D. B.

and M., for irrigation and domestic purposes (25 acres). Estimated cost \$1,500.00.

Permits to Appropriate Water Issued by The Department of Public Works, Division of Water Resources During the Month of December, 1930.

SAN BERNARDINO COUNTY—Permit 3625. Application 6778. William T. Elliot, Summit, California, December 1, 1930, for .062 c.f.s. from Little Horseshief Canyon in Sec. 27, T. 3 N., R. 5 W., S. B. for irrigation and domestic use on 5 acres.

EL DORADO COUNTY—Permit 3626. Application 6756. Ida M. Scott, Los Angeles, California, December 1, 1930, for .065 c.f.s. from unnamed stream in Sec. 30, T. 11 N., R. 16 E., M. D., for domestic use. Estimated cost \$300.00.

SAN JOAQUIN COUNTY—Permit 3627. Application 6802. Western Pacific Railroad Co., San Francisco, California, December 2, 1930, for .885 c.f.s. from Potato Slough in Sec. 13, T. 3 N., R. 4 E., M. D. M., for industrial use. Estimated cost \$11,500.00.

EL DORADO COUNTY—Permit 3628. Application 6765. J. R. Taylor, H. Derr and George Horshtinger, Sacramento, California, December 2, 1930, for 600 g.p.d. from unnamed stream in Sec. 19, T. 11 N., R. 16 E., M. D., for domestic use. Estimated cost \$150.00.

SHASTA COUNTY—Permit 3629. Application 6746. J. J. Vokal and Mary Vokal, Redding, California, December 8, 1930, for 5 c.f.s. from Olney in Sec. 24, T. 31 N., R. 5 W., M. D. M., for power purposes. Estimated cost \$250.00.

SHASTA COUNTY—Permit 3630. Application 6746. J. J. Vokal and Mary Vokal, Redding, California, December 8, 1930, for 5 c.f.s. from Olney Creek in Sec. 24, T. 31 N., R. 5 W., M. D. M., for irrigation and domestic use on 27 acres. Estimated cost \$250.00.

TRINITY COUNTY—Permit 3631. Application 6578. New River Mining Co., Los Angeles, California, December 8, 1930, for 40 c.f.s. from Quimby Creek in Sec. 29, T. 7 N., R. 7 E., H. M., for mining use. Estimated cost \$10,000.00.

SHASTA COUNTY—Permit 3632. Application 6786. August L. Cox and W. E. Winston, Big Bend, California, December 9, 1930, for .93 c.f.s. from Nelson Creek in Sec. 29, T. 37 N., R. 1 E., M. D. M., for irrigation and domestic use on 75 acres. Estimated cost \$1,200.00.

SUTTER COUNTY—Permit 3633. Application 6743. McGrath Bros. et al., Meridian, California, December 9, 1930, 131 c.f.s. from Butte Slough in Sec. 35, T. 16 N., R. 1 W., M. D., for irrigation use on 5,295.53 acres.

ROUTE COUNTY—Permit 3634. Application 6723. E. O. Cullen, Glendora, California, December 11, 1930, for 3 c.f.s. and 9 acre feet per annum storage from Empire Creek in Sec. 20, T. 23 N., R. 4 E., M. D., for mining purposes. Estimated cost \$200.00.

LAKE and MENDOCINO COUNTIES—Permit 3635. Application 6594. Snow Mountain Water and Power Co., San Francisco, California, December 11, 1930, for 50 c.f.s. and 14,500 acre feet per annum storage from South Eel River in Sec. 6, T. 17 N., R. 11 W., M. D., for irrigation use on 4905.9 acres. Estimated cost \$2,000,000.00.

NEVADA COUNTY—Permit 3636. Application 6597. South Yuba Co., Ltd., San Francisco, California, December 11, 1930, for 40 c.f.s. from Scotchman Creek in Sec. 18, T. 17 N., R. 11 E., M. D., for mining use. Estimated cost \$7600.00.

CLAYVILLAS COUNTY—Permit 3637, Application 6764, State of California, Division of Highways, District X, Sacramento, California, December 7, 1930, for .016 c.f.s. from an unnamed spring in Sec. 32, T. 7 N., R. 17 E., M. D., for domestic purposes. Estimated cost \$800.00.

SIERRA COUNTY—Permit 3638, Application 6798, Kate Hardy Mining Co., Downieville, California, December 17, 1930, for 2 c.f.s. from two unnamed ravines in Sec. 19, T. 19 N., R. 10 E., M. D., for mining and domestic use. Estimated cost \$650.00.

MONO COUNTY—Permit 3639, Application 6519, W. O. Garner, Pomona, California, December 18, 1930, for 150 g.p.d. from unnamed spring in Sec. 9, T. 4 S., R. 27 E., M. D., for domestic use. Estimated cost \$100.00.

BUTTE COUNTY—Permit 3640, Application 6790, Edward Steadman, Oroville, California, December 18, 1930, for 3 c.f.s. from Feather River in Sec. 27, T. 18 N., R. 3 E., M. D., for irrigation and domestic use on 253.117 acres. Estimated cost \$8000.00.

YUBA COUNTY—Permit 3641, Application 6731, W. C. Cunningham and A. Cunningham, Camptonville, California, December 22, 1930, for 0.2 c.f.s. from Mosquito Creek in Sec. 22, T. 18 N., R. 8 E., M. D., for irrigation and domestic use on 40 acres. Estimated cost \$1000.00.

TRINITY COUNTY—Permit 3642, Application 6596, Fred W. Ruhser, Weaverville, and Hayfork, California, December 31, 1930, for 80 c.f.s. from Big French Creek in Sec. 17, T. 5 N., R. 8 E., H. R., for hydraulic mining.

DAM APPLICATIONS AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of December, 1930.

MODOC COUNTY—Pope Dam No. 165, Lizzie D. Pope, Canby, California, owner; timber crib dam, 8½ feet above streambed with a storage capacity of 400 acre feet, situated on Pit River tributary to Sacramento River in Sec. 2, T. 41 N., R. 9 E., M. D. M., for diversion purposes for irrigation use.

MODOC COUNTY—River Dam No. 148-3, John O. Cummings, Alturas, California, owner; concrete dam, 7 feet above streambed, situated on Pit River tributary to Sacramento River in Sec. 18, T. 42 E., R. 12 E., M. D. M., for storage purposes for irrigation use.

SAN MATEO COUNTY—McMahon Gulch Dam No. 608, Dante Dianda and Giovanni Patroni, Halfmoon Bay, California, owner; earth dam, 41 feet above streambed with a storage capacity of 25 acre feet situated on McMahon Creek in T. 5 S., R. 6 W., M. D. M., for storage purposes for irrigation use.

MODOC COUNTY—Lindauer and Meckfessel Dam No. 152-2, Lindauer and Meckfessel, Alturas, owners; wooden crib dam, 7½ feet above streambed, situated on Pit River, for diversion purposes for irrigation use.

MODOC COUNTY—Meckfessel Dam No. 152-3, Gus Meckfessel, Alturas, owner; wood crib dam, 6.25 feet above streambed, situated on Pit River tributary to Sacramento River, for diversion purposes, for irrigation use.

MODOC COUNTY—Seven Bar Dam No. 153-2, F. W. Caldwell, Canby, owner; crib dam, 7.2 feet above streambed with a storage capacity of 125 acre feet, situated on Pit River tributary to Sacramento River in Sec. 29, T. 42 N., R. 10 E., M. D. M., for diversion purposes for irrigation use.

LASSEN COUNTY—Watson Dam No. 160-2, Peter Gerig, A. Babcock, et al., Bieber, owners; log dam, situated on Pit River tributary to Sacramento River in Sec. 3, T. 38 N., R. 7 E., M. D. M., for diversion purposes for irrigation use.

ALAMEDA COUNTY—Dingee Dam No. 31-14, East Bay Municipal Utility District, Oakland, owner;

earth dam, 18 feet above streambed with a storage capacity of 15½ acre feet, situated on unnamed draw tributary to Temescal Creek, for storage purpose for municipal use.

EL DORADO COUNTY—Lower Cleese Dam No. 468, John P. Cleese, Placerville, owner; earth dam, 18 feet above streambed, situated on North Canyon Creek tributary to South Fork American River in Sec. 35, T. 11 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

EL DORADO COUNTY—Upper Cleese Dam No. 468-2, John P. Cleese, Placerville, owner; earth dam, 21 feet above streambed, situated on North Canyon Creek tributary to South Fork American River in Sec. 35, T. 11 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

MODOC COUNTY—Hughes Dam No. 166, H. C. Hughes, Canby, owner; timber crib dam, 4 feet above streambed with a storage capacity of 170 acre feet, situated on Pit River tributary to Sacramento River in Sec. 30, T. 42 N., R. 10 E., M. D. M., for diversion and storage purposes, for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of December, 1930.

LOS ANGELES COUNTY—Chatsworth Dam No. 6-4, City of Los Angeles, Los Angeles, owner; earth dam, 40 feet above streambed with a storage capacity of 10,500 acre feet, tributary to Los Angeles River in Ex Mission San Fernando for storage purposes for municipal use. Estimated cost \$861,228. (Amending Application of Feb. 15, 1930.)

ORANGE COUNTY—Santiago Creek Dam No. 75, Serrano and Carpenter Irrig. Dist. and the Irvine Company, Orange, owners; earth dam, 110 feet above streambed with a storage capacity of 25,000 acre feet, situated on Santiago Creek tributary to Santa Ana River in T. 4 S., R. 8 W., S. B. M., for storage purposes for irrigation use. Estimated cost \$700,000. Fees paid \$4,000.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of December, 1930.

MODOC COUNTY—Porter Dam No. 162, Pearl F. Porter, Alturas, owner; earth and rock dam, situated on tributary of Parker Creek in Sec. 12, T. 42 N., R. 13 E., M. D. M.,

NEVADA COUNTY—Culbertson Dam No. 97-17, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary of So. Yuba in Sec. 15, T. 18 N., R. 12 E., M. D. M.,

NEVADA COUNTY—Lower Feeley Dam No. 97-35, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam situated on Fall Creek tributary to South Yuba River in Sec. 29, T. 18 N., R. 12 E., M. D. M.,

NEVADA COUNTY—Lower Lindsey Dam No. 97-76, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 20, T. 18 N., R. 12 E., M. D. M.,

NEVADA COUNTY—Meadow Lake Dam No. 97-40, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on a small creek tributary to Fordyce Creek in Sec. 27, T. 18 N., R. 13 E., M. D. M.,

NEVADA COUNTY—Middle Lindsey Dam No. 97-41, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. M.,

NEVADA COUNTY—Rucker Lake Dam No. 97-44, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Rucker Creek tributary to South Yuba River in Sec. 8, T. 17 N., R. 12 E., M. D. M.,

NEVADA COUNTY—Upper Feeley Dam No. 97-45, Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Fall Creek tributary to South Yuba River in Sec. 28, T. 18 N., R. 12 E., M. D. M.,

ALAMEDA COUNTY—Dingee Dam No. 31-14, East Bay Municipal Utility District, Oakland, owner; earth dam, situated on unnamed draw tributary to Temescal Creek.

MODOC COUNTY—Webb Flat Dam No. 160. Gerig Bros., Bieber, owners; earth dam, situated on Webb Flat tributary to Egg Lake in Sec. 5, T. 41 N., R. 7 E., M. D. M.

CONTRA COSTA COUNTY—Antioch Dam No. 3. Town of Antioch, Antioch, owner; earth dam, situated on unnamed creek tributary to San Joaquin River in Sec. 36, T. 2 N., R. 1 E., M. D. M.

SAN MATEO COUNTY—McMahon Gulch Dam No. 608. Diarda and Patroni, Halfmoon Bay, owners; earth dam situated on McMahon Creek in T. 5, S., R. 6 W., M. D. M.

PLACER COUNTY—Lower Peak Dam No. 97-37. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam situated on small creek tributary to South Yuba River in Sec. 30, T. 17 N., R. 14 E., M. D. M.

PLACER COUNTY—Upper Peak Dam No. 97-47. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on small creek tributary to South Yuba River in Sec. 32, T. 17 N., R. 14 E., M. D. M.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of December, 1930.

CONTRA COSTA COUNTY—Chenery Reservoir No. 551. California Water Service Company, San Francisco, owner; earthen dam, situated on tributary to Sacramento River in Sec. 13, T. 2 N., R. 2 W., M. D. M.

RIVERSIDE COUNTY—Alvord Dam No. 815. Riverside Water Company, Riverside, owner; earth dam.

MODOC COUNTY—Lower Roberts Dam No. 157-2. H. M. Roberts, Lookout, California, owner; earth dam, situated on Antelope drainage tributary to Pit River in Sec. 11, T. 35 N., R. 7 E., M. D. M.

MODOC COUNTY—Porter Dam No. 162. Pearl F. Porter, Alturas, owner; earth and rock dam, situated on tributary of Parker Creek in Sec. 12, T. 42 N., R. 13 E., M. D. M.

ALAMEDA COUNTY—Dingee Dam No. 31-14. East Bay Municipal Utility District, Oakland, owner; earth dam, situated on unnamed draw tributary to Temescal Creek.

SANTA CLARA COUNTY—Lower Howell Dam No. 622-2. San Jose Water Works, San Jose, California, owner; earth dam, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. M.

NEW HAMPSHIRE—Definite progress in beautifying roadsides has been made this year, according to Frederick A. Gardner, State Highway Department Engineer. Grass, trees and shrubbery planted along the roadside and at intersections have greatly enhanced highways.

Simplified Spelling

The new church treasurer wrote a letter, and 50 per cent of the members paid up. He wrote another and all but one paid. Finally he wrote one more and the last man sent in his check. Shortly afterwards the pastor dined at the man's home.

"You have a new treasurer?" inquired the host.

"Yes," answered the minister.

"He writes a nice letter," remarked the host, "except that he can't spell."

"Is that so?"

"Yes, he ought to be corrected on that. He spelled 'skunk' with a 'c' and had two 's's' in 'lousy.'"

THE FROG

Speaking of school teachers, one of them sent in an essay on the frog, written by a Japanese student: "What a wonderful bird the frog are! When he stand, he sit, almost. When he hop, he fly, almost. He ain't got no tail, hardly, either. When he sit, he sit on what he ain't a, almost!"

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
GEORGE C. MANSFIELD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9. JANUARY, 1931 No. 1

RESTORATIVES

When I grow tired of seeking pelf, and feel so sorry for myself,

I wander down to Limping Lane, where begging folk hold sway;

And there I watch the halt and lame play on at this Existence game.

And hear the beggars whine and moan when once you look their way.

I see the blind and crippled man who deftly shakes his money can;

The legless one who rides upon a cart with tiny wheels;

The twisted creature with a leer; the scarred and maimed, who know no cheer;

And when I hear a laugh at all, it comes in nervous peals.

And when at last I stumble back and find my daily beaten track,

I breathe a prayer so fervent that it can not be ignored—

I quite forget my selfish woes—I have my fingers and my toes—

I have my eyes, and, through it all, my Hope has been restored!

—Selected.

In the days before oil was discovered in Texas, a traveling man stopped for the night at a dry-laid ranch near Wink. As he discussed the affairs of the country with his host he became more inquisitive as to how the ranch paid its way. At last he ventured the question:

"How in the world do you make a go of things at all?"

Indicating the hired man, who was sitting at the far end of the supper table, the host replied: "You see that feller there? Well, he works for me and I can't pay him. In two years he gets the ranch. Then I work for him till I git it back."—*Dravo Bulletin*.

Don't hunt for trouble

But look for success.

You'll find what you look for,

So don't look for distress.

If you see but your shadow,

Remember, I pray,

That the sun is still shining,

But you're in the way.

Mary Lee: "Bill is an awful pest—he never seems to know when to stop."

Mary Lou: "That's strange. I was riding with him last night and he found a dandy place."

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Department of Public Works

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Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

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Buying Power of Public Works Is Factor in Business Restoration

By JAMES I. HERZ, Deputy Director, Department of Public Works.

MUCH attention has been given, and properly so, to the very large part that the Department of Public Works is playing in relieving unemployment in California. It is indeed a great privilege given to those in charge of the public works to be able to provide a larger volume of employment for the labor of this state, and thus, by its example, to encourage private industry to do likewise.

But public works in California are not only a large factor in relieving the distress of the unemployed, but they also constitute a more important factor in creating a market for California commodities than the public generally realizes. Both labor and business, directly and indirectly, are thus the beneficiaries of the large public works program that Governor Rolph has launched throughout the State, and that various counties, cities and other governmental units have undertaken in their respective jurisdictions.

The largest purchases in the Department of Public Works are those made by the Division of Highways. These highway expenditures are ordinarily considered in terms of labor and of so-called highway materials, that is the materials that we actually see going into the road—cement, crushed rock, asphalt, steel, oil and so forth. These materials, however, are but a part of the purchases that are necessary in building a highway system.

Camps and maintenance crews must be maintained, and accordingly the purchase of groceries and supplies becomes necessary.

The work covers an enormous detail, and with each ramification, new supplies, varied in quantity and distinctive in character, become necessary.

Space will not permit an analysis of the score of items that make up the category of these supplies. They enter into every branch of industrial and agricultural life, and range from totals of millions paid during a biennium for such materials as gasoline, oils, and greases; asphalt and rock and fuel oils; cement and crushed rock, sand and gravel; explosives; timber; automobiles, trucks and equipment; to a few dollars expended for some minor item of camp use.



JAMES I. HERZ, Deputy Director of the Department of Public Works and Governor JAMES ROLPH, JR.

Not including materials and supplies purchased by contractors to whom state jobs are awarded, the cost of which was annually far into the millions, the purchases made directly by the Department of Public Works make it one of the largest single buyers in California.

The purchases made for building such portions of the highway as the Division of Highways may be directly constructing and for maintenance of the highways; the purchases of the Division of Architecture for construction and repair work at the state institutions; equipment bought for traffic work on the highways by the Division of Motor Vehicles and for automobile registration and supplies incidental thereto; the supplies needed for various activities carried on directly by the Division of Water Resources; all these approximate \$500,000 per month.

I have been impressed with the similarity that the distribution of materials purchased in highway work bears to the distribution of labor. One of the chief reasons that highway work is particularly valuable in relieving unemployment lies in the widespread distribution of the work. Roads must be built and maintained all over California. Hence labor must be employed in every county of the

State. The beneficial effects of this employment are thus automatically distributed.

Similarly with goods purchased. The spread is over the whole field of industry, and the stimulating effect of the market thus supplied is exceedingly far reaching.

There are a few general considerations governing the purchase of supplies that I know reflect the opinion and desire of Governor Rolph's administration and which I believe constitute sound business for the people of California. These are:

First, the buying power of the Department of Public Works should be used to promote the general prosperity of California as far as possible. Supplies capable of purchase locally and at reasonable price should be purchased locally. This applies to purchases for work, whether carried on by the State directly or indirectly through contractors. In this way a spread of prosperity over the widest possible base is secured.

Second, the buying power of the state should be used to encourage the development of industry in California. Buying at home is good business both for the state and the individual.

Third, preference should be given wherever possible to the use of native California material.

Both Governor Rolph and Colonel Walter E. Garrison, director of the Department of Public Works, have requested me to give close and analytical attention, not only to the cost and quality of materials and supplies, but to the wide distribution of this business over the State, and the encouragement of the use of California manufactured, California produced and California grown goods. Governor Rolph feels, and the Department of Public Works is in full accord with this view, that this is a most important phase of his policy of bringing prosperity back to California on a basis that offers promise of permanence through the firmness of its economic foundation and the soundness of its business structure.

FRONT COVER PICTURE

The picture on the front cover gives a construction view of Shasta River Crossing No. 3 on the Pacific Highway. The bridge is a reinforced concrete arch structure of spectacular proportions and design.

Modern child (seeing rainbow for the first time) — "What's it supposed to advertise, dad?"—*Passing Show.*

Registration Fees Are Apportioned to State and Counties

BASED on the registrations of motor vehicles to be found on page 22 of this issue, the Division of Motor Vehicles announced that the total apportionment of motor vehicle fees for the year 1930 to the State Highway Department and the various counties to be used for reconstruction and maintenance of highways totaled \$6,775,073. Of this sum, \$3,387,536 goes to the State Highway Department and the remaining half or \$3,387,536 goes to the counties, each county receiving its share in proportion to the number of vehicles registered shown below:

County	Total registrations	Counties share of apportionment
Alameda	148,381	\$239,435 90
Alpine	97	156 53
Amador	2,619	4,226 17
Butte	15,040	24,269 39
Calaveras	2,436	3,930 87
Columbia	4,863	7,847 21
Contra Costa	26,059	42,050 26
Del Norte	1,933	3,119 20
El Dorado	3,325	5,381 54
Fresno	61,312	98,936 48
Glenn	5,554	8,962 25
Humboldt	15,773	25,452 20
Imperial	25,548	41,225 85
Inyo	2,854	4,605 37
Kern	38,290	61,690 07
Kings	10,616	17,130 57
Lake	3,382	5,457 38
Lassen	4,125	6,656 33
Los Angeles	857,843	1,384,263 58
Madera	6,842	11,040 63
Marin	11,483	18,529 61
Mariposa	1,304	2,104 21
Mendocino	7,845	12,659 13
Merced	15,623	25,210 15
Modoc	3,155	5,091 08
Mono	483	779 40
Monterey	21,473	34,650 04
Napa	8,314	13,415 94
Nevada	3,472	5,604 23
Orange	51,681	83,295 36
Placer	9,416	15,194 19
Plumas	2,504	4,040 60
Riverside	31,718	51,181 94
Sacramento	49,279	79,519 37
San Benito	4,618	7,451 86
San Bernardino	48,755	77,557 80
San Diego	79,040	127,543 38
San Francisco	157,813	254,655 91
San Joaquin	40,890	65,837 17
San Luis Obispo	12,328	19,893 15
San Mateo	26,156	42,206 79
Santa Barbara	27,828	44,904 82
Santa Clara	57,784	94,357 16
Santa Cruz	15,703	25,339 24
Shasta	5,484	8,849 29
Sierra	813	1,311 90
Siskiyou	8,775	14,159 83
Solano	14,381	23,205 99
Sonoma	27,693	44,541 75
Stanislaus	27,452	44,502 93
Sutter	6,424	10,366 13
Tehama	5,814	9,381 80
Trinity	774	1,248 97
Tulare	34,016	54,890 12
Tuolumne	3,236	5,221 79
Ventura	22,752	36,713 90
Yolo	10,164	16,401 20
Yuba	5,184	8,265 19
Totals	2,099,293	\$3,387,536 93
Exempts	37,337	
Total registrations	2,136,630	

Bridging Shasta Canyon Marks Monumental Highway Undertaking

ONE of the most monumental highway undertakings now under way in the United States is the relocation of the Pacific Highway along the Shasta River in Siskiyou County, California.

This project is of particular interest for these reasons:

First, it completes on the California side



View showing Cantilever Steel Deck Truss at Shasta Crossing No. 2. The deck of this bridge is 260 feet above the stream bed. The picture shows the present State highway beneath the new bridge.

an adequate interstate connection with Oregon. This is of importance to travel.

Second, from the point of view of the engineers, the project is symbolic of the new era in highway construction, an era in which the expenditure of very large sums of money in short distance projects is justified by rea-



View of Shasta Bridge No. 2 showing anchor arm in place, the beginning of a construction of the cantilever and the highline used in construction.



CHARLES E. ANDREW, Bridge Engineer, Division of Highways.

son of heavy traffic, the large total savings that the improvement will afford to travel, and the increased measure of safety that the betterment will assure.

The Shasta River project is $7\frac{1}{2}$ miles in length and, except for the first two miles, lies entirely in the Shasta and Klamath River canyons.

A PUZZLING IMPROVEMENT PROBLEM

The original state highway built in 1915 had become entirely inadequate for travel. Although built to what were considered satisfactory standards at the time of its construction, traffic of today found its short tangents, short radius curves, adverse grades and width of only 16 feet both inadequate and

dangerous. Its improvement, however, presented a puzzling problem to engineers.

On the one hand, reconstruction of the road to present day standards on the alignment of the old road was prohibited by the natural restrictions of the Shasta River Canyon.

On the other hand, the relocation of the road involved enormous expenditures because

267 feet above the river bed, and is of sufficient height above the river to clear the State Capitol were it placed beneath it. The cost of grading and surfacing the connecting road is estimated at \$608,400.

The average per mile cost of the project, including highway and bridges, accordingly will approximate \$150,000.

SOME INTERESTING COMPARISONS

Compensating for the cost of the project is the improvement that it affords. Here are some interesting comparisons:

	Old Road	New Road
Length-----	9.37 miles	7.46 miles
Total angles-----	3659 degrees	1205 degrees
Number of curves-----	137	25
Maximum radius-----	1500 feet	5000 feet
Minimum radius-----	50 feet	400 feet
Maximum grade-----	7 per cent	4.14 per cent
Adverse grade-----	248 feet	146 feet

Added to this is the vastly greater scenic attractions of the new location.

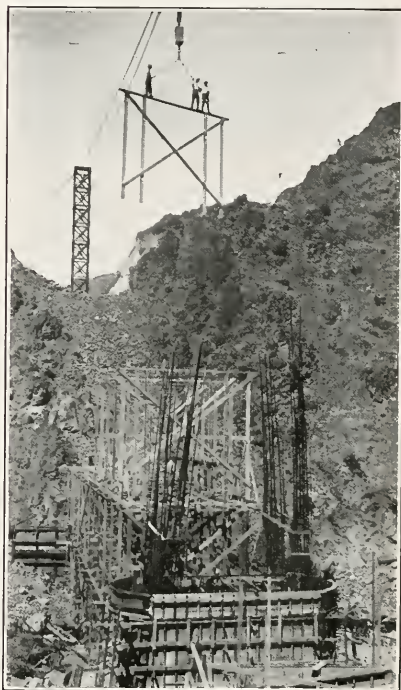


Placing a column form on Shasta Bridge No. 3.
The reinforced arch has been partly poured.

of the rough and precipitous nature of the country, its high cliffs and rock so hard that it was both difficult to drill and extremely destructive to grading equipment.

The engineers had to choose between a low grade road involving the construction of tunnels, or a higher grade line, cutting with bridges across both the lateral canyons and the main canyon of the Shasta River. The latter plan was chosen.

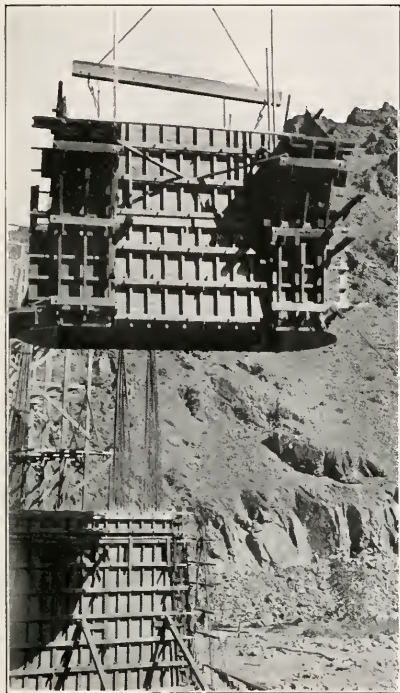
Under the plan as adopted, five bridges across these canyons have been completed or are now in course of construction together with the connecting highway. The total cost of these bridges will approximate \$467,000. The deck of the highest of these bridges is



Constructing false work for the arch on Shasta Bridge No. 3.

HOW TRAVEL WAS DETOURED

One of the important features of early construction was the preparation of suitable detours. Insofar as possible, the old road was used. In several locations, however, it was necessary to leave the old road and cross to the other side of the Shasta River. This not only required the construction of a new



Placing a center pier form on Shasta Bridge No. 3. This form contains reinforcing steel in place. The weight of the form with the steel is 8 tons.

road, two miles in length, 16 feet in width and with an oiled rock surfacing, but it also made necessary the construction of three temporary detour bridges across the Shasta River. These detour roads and bridges have served traffic in a most satisfactory manner.

After the road has been thrown open to travel, which it is believed will be about June, 1931, the old road will be cleared of debris, and left for the use of fishermen and local residents.

The beauty of the design of the bridges now being erected across the canyons of the

Shasta River has attracted widespread comment. Some details of these bridges will be of interest.

The first of these bridges to be constructed is known as Shasta No. 1 and crosses the Shasta River at a point about five miles north of Yreka. It is a reinforced concrete structure consisting of five girder spans supported by concrete piers and abutments. The total length is 250 feet and the roadway width 24 feet. This bridge was completed in November, 1929, at a total cost of \$28,200.

The second in the series crosses high above a narrow rock ravine known as Dry Gulch which feeds into the Shasta River location and is about five and one-half miles north of Yreka. This is also a reinforced concrete structure but of a different type than Shasta No. 1. The main span is a 200-foot open spandrel arch founded on concrete abutments resting on solid rock well up on the steep slopes of the ravine. Forty-foot girder spans on both ends connect the arch span with the roadway approach fills. The cost of the bridge was \$70,000. It was completed in December, 1930.

CLEARANCE FOR THE STATE CAPITOL

For the second crossing of the Shasta, about six miles north of Yreka, a structural steel bridge is being erected. This structure will consist of two cantilever arms, two anchor arms and a suspended span, each 138 feet long. In addition, 52-foot steel stringer spans at each end extend from the anchor piers to concrete bents set in the approach fills. The clear span between the main supporting piers of the cantilever span is 414 feet. The finished concrete roadway on the bridge will be about 267 feet above the river and 220 feet above the present highway. Between the roadway of this bridge and the river there is sufficient clearance to place the State Capitol.

The third and most northerly bridge over the Shasta River is about $7\frac{1}{2}$ miles north of Yreka and $2\frac{1}{2}$ miles above the mouth of the river. The reinforced concrete, open-spandrel arch type was selected for this crossing. The bridge consists of two 200-foot arch spans, two 40-foot and two 32-foot reinforced concrete girder spans. The construction of both this bridge, and that across the Klamath River about $2\frac{1}{2}$ miles north, was featured by rapid and careful work. It is expected that all work on both bridges will be finished in February. The estimated cost of Shasta River bridge No. 3 is \$98,000.

The Klamath River bridge is about 10 miles north of Yreka, just above the mouth of the Shasta River and near the northerly end of

(Continued on page 24.)

State Patrol Officers Are Given Widespread Praise for Courtesy

A. B. Saroni of Oakland writes the following letter to the headquarters of California Highway Patrol at Sacramento:

As I am a firm believer in giving credit where credit is due, I can not restrain myself from writing to advise you of the kindness of one of your State Patrolmen. On Wednesday, January 14th, was on my way to Sacramento where I was due at the U. S. Federal Court at 2 p.m. Between the town of Davis and the Causeway I blew out a tire. Just as this happened one of your State Patrol cars passed and I flagged it with the view of getting a ride into Sacramento in order to keep my appointment. However, the officer was not going into Sacramento but cheerfully volunteered to help me change my tire as I had explained to him the circumstances of my anxiety to be there on time, as I was a witness in a Federal case and I had been courteously granted a one-day leave of absence so that I might avail myself of the last duck hunt of the season, but only on the promise that I would return for the afternoon session of court on Wednesday.

This willingness and kindness on the part of your officer enabled me to reach Sacramento at the appointed time. The officer in question was State Patrolman Jacobs, and I wish to tell you at this time that I deeply appreciate his courtesy. It is highly praiseworthy that your men should be a little more than just interested in police work alone.

TRAFFIC OFFICER HELPED

The following appreciation of the manner in which Traffic Officer C. H. Nissen of Contra Costa County handled a traffic violation case was written by E. N. Deering of Dunsmuir:

We had occasion to be stopped by your Traffic Officer Number 98 for an infraction of the traffic regulations. It happened in Contra Costa County near Pinole. Now, in behalf of Mr. 98 I want you to know that he disposed of our case in a most gentlemanly and pleasing manner. I certainly believe him to be a credit to your department and I shall be very high in my praise for him and your department at all times. I should like to know what his name and address is if that isn't asking too much.

THANKS FROM STOCKTON

Under date of January 8th, the Down Town Association of Stockton writes as follows:

On behalf of the members and Directors of the Down Town Association of Stockton, I wish to thank you for the quick action that you took, to grant us permission to move the large Community Christmas tree to Stockton, and for assigning the two traffic officers to accompany it.

Words can not express our sincere appreciation, for your wonderful spirit of cooperation.

APPRECIATION FROM AMERICAN LEGION

This letter is from J. M. Yoakim, adjutant of the San Diego Council of the American Legion.

COL. GARRISON CHOOSES "363," ARMY NUMBER FOR HIS LICENSE PLATE

(From the Stockton Record)

SACRAMENTO, Jan. 27.—Is there luck in numbers? Colonel Walter E. Garrison of Lodi, now heading the important Department of Public Works in Governor Rolph's cabinet, thinks there is, and his choice is 363.

Going overseas with the famous 363d of the 91st Division in the World War, Garrison won rapid promotion and the *croix de guerre*.

Now prepared to go over the governmental top on good roads, a mammoth State building program, and schemes to meet the unemployment crisis, Garrison has chosen as his auto license number 363.

The San Diego County Council American Legion takes this opportunity to thank you, in behalf of the Legionnaires of San Diego County, for the motorcycle escort to the area meeting at Riverside January 11th.

We feel this was an honor shown us by the California Highway Patrol, and again we most heartily thank you.

AIDED HIGH SCHOOL BAND

The following letter is from the Board of Trustees of the Ventura Union High School District:

On behalf of the Board of Trustees of the Ventura Union High School District I wish to thank you for the fine services your department rendered on January 1st in conducting our School Band from Ventura to Pasadena. I assure you that we greatly appreciate this service and commend both you and your department very highly for it.

AID GIVEN IN ACCIDENT

S. M. Keene of Sacramento testifies in the following letter to aid given his wife:

My wife met with an automobile accident while driving between Sacramento and Folsom. Tom Taylor and Herb Bolton were on patrol at the time and rendered such wonderful service that I feel they are both worthy of a word of commendation to you, their superior officer. The efficient as well as courteous way in which they handled the emergency probably saved my wife much discomfort and there is nothing I can say that will express my appreciation to them, but I feel that such fine officers are what we need on the highways.

A. L. BANKS IS APPOINTED ASSISTANT TO MR. HERZ

A. L. Banks, for many years a prominent newspaperman of the San Joaquin Valley and recently city clerk of Stockton has been appointed assistant to James I. Herz, deputy director of the State Department of Public Works.

He: "My brow is lily white."

Her: "Yes, ivory is white, I know."

Pacific Highway Bridge Is Dedicated

AMID A fanfare of trumpets, the beat of drums, and the strains of music the half million dollar Cottonwood creek bridge was dedicated on January 17th, accepted by the State and thrown open to the traveling public.

State and county officials, civic leaders and 3000 citizens of all northern California counties gathered for the elaborate ceremony of dedication.

Earl Lee Kelly, chairman of the California State Highway Commission, accepted the bridge on behalf of Governor James Rolph.

In accepting the structure, Mr. Kelly spoke in part as follows:

We are assembled here today to dedicate this magnificent structure which shall be known for all time as the Cottonwood bridge.

This bridge forms one more link in the chain which binds the people of Redding, Anderson, Cottonwood, Red Bluff and Corning more closely together. It not



The New Cottonwood Creek Bridge.

works to expand their program. This we intend to do, which will result in the relief of the personal distress of large numbers of our deserving citizens.

I desire to say that our every effort will be exerted to reflect credit upon our new governor and to assist him in making the next four years outstanding in the history of California—an era of friendly, sound and economical businesslike administration.

And in the building of our highways, and particularly in the dedication of this bridge which event we are celebrating today, I am reminded of



Subway at end of North Approach to Cottonwood Creek Bridge.

only brings the people of our own local communities more closely together, but it forges another link in the chain which connects the ends of the Pacific highway and extends from the Canadian line to the Mexican border.

I am proud today to stand before my friends and neighbors and, speaking as the chairman of the California State Highway Commission, accept this bridge on behalf of Governor Rolph and his administration.

I deem it a privilege to be assigned an active part in building and maintaining the roads of our State which roads and highways have contributed so largely to making California what it is today.

I know that I speak for all members of the California Highway Commission when I say that we are determined that the period for which Governor Rolph has entrusted us with responsibility in State highway matters shall be years of active development.

In a period of unemployment such as we are having at present it is the duty of those in charge of public

"The old man, traveling a lone highway,
Came at the evening, cold and gray,
To a chasm vast and deep and wide.
The old man crossed in the twilight dim,
The sullen stream had no fear for him.
But he paused when safe on the other side
And built a bridge to span the tide.
'Old Man,' said a fellow pilgrim near,
'You are wasting your time with building here;
You've crossed the chasm vast and wide,
Why build you this bridge at evening tide?'
The builder lifted his old gray head,
'Good friend, in the way I've come,' he said,
'There followeth after me today.
A youth whose feet must pass this way;
This stream that has been as naught to me,
To that fair haired youth might a pitfall be;
He, too, must cross in the twilight dim—
Good friend, I'm building this bridge for him.'"

And so it is with us my friends, we are building these beautiful highways and magnificent bridges, not only for ourselves, but for those who are coming and are yet to come. And hope that you and they, may be able to say of Governor Rolph and his administration that we have built wisely and well.

Governor Rolph Telegraphs Regrets

In a telegram expressing his regret at being unable to attend the dedication exercises, Governor Rolph said:

I greatly appreciate the invitation which your board, through you, has extended to me to participate in the opening and dedication of the Cottonwood Bridge, connecting Shasta County with Tehama

(Continued on page 19.)

Don't Tamper with Gasoline Tax Moneys

By COLONEL WALTER E. GARRISON, Director of the Department of Public Works

The following article was written by Colonel Garrison in response to a request by the California State Automobile Association for an expression of Colonel Garrison's views for publication in *Motor Land*, on the subject of suggested diversion of gasoline tax funds to uses other than to which they are not devoted. The article appeared in the current issue of *Motor Land*.

THE question has been asked me by the California State Automobile Association as to my attitude toward suggested changes in the allocation of revenues derived from gasoline taxes.

My answer is that I am opposed to using any part or portion of the three-cent gasoline tax for any purpose other than that for which it is being used at the present time.

The reason for my position in this matter can be stated very briefly: The highways of California need every cent of income that they are now getting from gasoline taxes, and this need will continue for some years yet to come.

I do not think that the need of the counties for the funds they receive from the one-cent gasoline tax apportioned to them for use upon local roads will be seriously disputed.

The study that has just been concluded of the requirements of the state highway system for the next ten years furnishes convincing proof that gasoline funds can not be diverted from the state highway system without serious delay and impairment of the road building program with consequent injury to the whole state.

It may be well to summarize again the findings of this important investigation.

Thus during this ten-year period, concluding with 1940, it is estimated that \$313,565,906 must be expended for construction and reconstruction projects on the state highway system. This sum is exclusive of maintenance or the improvement of roads that will undoubtedly come into the system at this session of the Legislature. These additional roads alone will ultimately cost \$71,387,655 for their improvement. The total income for construction and reconstruction of eleven miles same period is estimated at \$320,352,175. Certainly there is no undue surplus here.

I fully endorse the statement of State Highway Engineer C. H. Purcell, who, in commenting on this study, said:

Comparison of these carefully prepared estimates

of cost and revenue, derived independently of each other, leaves no doubt that, with revenues as now made available, a very cautious and conservative program must be pursued in state highway improvement and that any other course or a diversion of highway funds to other purposes will jeopardize the program of improving and constructing the state highways to a capacity adequate to take care of traffic developing during this ten-year period.

The public mind has not yet fully adjusted itself to the fact that highway construction and highway expenditures must be relative to the traffic demands to serve which highways are built.

We hark back to the days of the early bond issues, and think that because of the greatly increased revenues that the gasoline taxes are giving us, that there must be a surplus of highway funds.

We fail to remember that in a twenty-year period automobile registration in California has increased from slightly over 10,000 registered motor vehicles to over 2,000,000, and this huge increase in the use of our highways has made it necessary to build and maintain roads to standards of safety and traffic capacity both undreamed of and unnecessary in the days of lighter travel and lesser financing. We forget that were it not for the larger and continuous income that the gasoline tax funds have given state highways, the system would have completely collapsed years ago.

This is not a plea for more money for our state highways. I realize the heavy burden of taxes under which the people of California are laboring. I believe that our present revenues are adequate to do the work required within a reasonable period of time. I know, however, that the revenues now going to the highways can not be decreased by diversion of funds or otherwise, without serious injury to the state. Today, as never before, the growth and prosperity of California are dependent upon adequate highway transportation.

Nor do I mean to minimize the desirability of some of the purposes to which it has been suggested that gasoline tax funds be diverted. The more important of these purposes are now being cared for in an orderly manner out of present highway income. Others are and should be secondary to the big job now before us, that of completing our state highway system.

In this connection it may be of interest to know the status of the state highway system in

(Continued on next page.)

Architects at Work Speeding Up State Building Activities

IN PURSUANCE of the policy of Governor Rolph to speed up the construction of public buildings as a means of bettering business and relieving unemployment, Colonel Walter E. Garrison has appointed architects in private practice throughout the State to prepare plans and specifications for a number of projects included in the institutional building program. The appropriation bill providing funds for the work was passed by the Legislature at the request of Governor Rolph before the legislative recess. The employment of private architects will make plans available for contract many months in advance of the time that would be required had all these plans to be prepared by the Division of Architecture.

Architects who have been thus appointed up to February 15th and the buildings upon which they are preparing plans and specifications are as follows:

Russell Guerne De Lappe, Oakland; dairy unit, Preston School; appropriation, \$40,000.

Fred L. Swartz and C. J. Ryland, Fresno; library, Fresno State Teachers College; appropriation, \$125,000.

William H. Wheeler, San Diego; gymnasium and pool, San Diego State Teachers College; appropriation, \$155,000.

Peter L. Sala, Stockton; remodel kitchen, etc., Stockton State Hospital; appropriation, \$65,000.

Franklin T. Georgeson, Eureka; training school, Humboldt College, Arcata; appropriation, \$170,000.

Ralph Wyckoff, San Jose; training school, San Jose State Teachers College; appropriation, \$202,000.

Charles F. B. Roeth, Oakland; primary unit and dining room, California School for Deaf, Berkeley; appropriation, \$422,000.

Frederick H. Meyer, San Francisco; hospital, Veterans Home, Yountville; appropriation, \$500,000.

Charles F. Dean, Sacramento; California National Guard, Yuba City Armory; appropriation, \$25,000.

Chester Cole, Chico, library and class rooms, Chico State Teachers College; appropriation, \$117,000.

Frederick H. Eley, Santa Ana; superintendent's cottage and ward building, Narcotic State Hospital, Spadra; appropriation, \$55,000.

G. Stanley Wilson, Riverside; dairy unit, Patton State Hospital; appropriation, \$25,000.

Gilbert Stanley Underwood Company, Limited, Los Angeles; ward building at the farm, Norwalk State Hospital; appropriation, \$75,000.

Walker and Elisan, Los Angeles; dairy unit and patients farm cottage, Pacific Colony, Spadra; appropriation, \$75,000.

Bennett and Haskell, Pasadena; National Guard Armory, Pasadena; appropriation, \$50,000.

No one is useless in the world who lightens the burden of it for anyone else.—*Dickens*.

Ask Grade Crossing Driving Law Be More Vigorously Enforced

THE need for a more vigorous enforcement of section 114, of the California Vehicle Act, requiring motorists to stop before crossing railroad tracks when a danger signal is being displayed indicating the immediate approach of a train by municipalities throughout the state as a means of reducing grade crossing accidents, was stressed by the Railroad Commission in a decision rendered by Commissioner Leon O. Whitsell in a proceeding involving crossing protection in the city of Burlingame.

A recent report of Mr. Joseph G. Hunter, chief transportation engineer of the Railroad Commission, points out the fact that over one-half of the grade crossing accidents in California occur at protected crossings, including many accidents at grade crossings protected by gates. A large proportion of the accidents at crossings result from motorists trying deliberately to beat the train over the crossing.

DON'T TAMPER WITH GASOLINE TAX MONEYS

(Continued from page 8.)

terms of improved and unimproved mileage. The following table tells this story, and depicts the task yet before the people of California:

Type	Mileage	Percentage of System
Cement concrete.....	1607,315	25.3
Asphalt concrete.....	573,788	9.1
Bituminous macadam.....	410,148	6.5
Oil-treated armor, crushed oil mix, gravel or stone miscellaneous....	1502,165	23.7
Rock surface.....	388,406	6.1
Earth.....	1830,688	28.9
Bridges.....	24,565	0.4

With this whole picture before us I feel certain that the motoring and taxpaying public of California will agree with me that any diversion of gasoline tax funds from their present uses would be most unwise and would serve to injure rather than advance the well-being of California.

CAN PARK IN THIS TOWN

Ground plans for the town to be built near the site of the Hoover Dam on the Colorado River have been worked out along lines providing ample parking space for automobiles with the object of keeping idle cars entirely off the streets.

New Bridge Entrance Into San Diego



The Rose Canyon Bridge.

ROSE CANYON BRIDGE, 50 feet wide and 210 feet long, recently completed at a contract cost of \$30,515, lies on the newly constructed Rose Canyon line change north of San Diego. This line change reduces travel distance approximately five miles and corrects slow speed alignment

between Los Angeles and San Diego sufficiently to reduce travel time approximately twenty-five minutes. It is roughly estimated that the present yearly saving to traffic is equivalent to 5 per cent interest on \$7,000,000, which latter sum is more than twenty times the total cost of building the road.

Highway Worker is Drowned; Companions Have Narrow Escape

AVIGILANT search was being made along the rocky coast line of Lime Kiln Canyon, north of Willow Creek, Saturday, for the body of Albert B. Castro, 28, who drowned trying to beach a boat near the Roosevelt highway convict camps, says the *San Luis Obispo Telegram*, under date of January 24th.

He was one of the engineering crew for the California Highway Commission which has been making surveys for a new San Simeon-Carmel road camp about 10 miles north of Willow Creek. He was swept out to sea by an undercurrent while attempting to swim to shore.

Accompanied by Kenneth Ackley, Tom Neff, Lloyd Jackson and William Owens, the young man had been at San Simeon since Wednesday, waiting for favorable tides before attempting sail by motor launch up to the canyon site and land supplies for the new camp.

They were warned by C. R. Burns, locating engineer, to await calm weather before making the trip; he continued on horseback to the isolated camp to await the boys' arrival by launch.

At about 5 o'clock Friday morning they left from San Simeon Bay by launch with weather and tide favorable.

According to highway officials, Castro had been working with the Commission for the past eight years and had proved himself particularly adept at making difficult landings among the rocky and treacherous shores which extend along the north coast into Monterey County.

SEA ROUGH

However, when the five boys reached the canyon landing the sea had turned rough and waves were lashing the little cove where they had planned to land.

A landing had been successfully made at the same place once before and Castro and Kenneth Ackley decided to swim ashore.

Burns was above the launch on the hillside watching the boys in their efforts, and threw a rope to their assistance. Ackley made the first dive but missed the rope and was caught with the tide and carried into the cove where he grasped a rock, to which he clung.

Castro saw Ackley go into the cove and began swimming towards him when he was suddenly caught in an undertow and his body swept from sight.

ACKLEY RESCUED

Ackley was rescued from the rock and is receiving treatment at the prison camp from the shock and exposure. Search for Castro's body has been continued since the fatal accident, but little hope is held for its recovery along the desolate and rocky coast.

Although exhausted from their battle with the waves and horrified at the tragic ending of their trip, the three remaining boys turned the launch back toward San Simeon to make a report of the accident. They reached San Luis Obispo about 5 o'clock and notified highway officials here.

A young salesman whose wife was making a prolonged visit at the home of her parents became quite excited on receiving the following telegram: "Twins arrived, doing fine, more later."

He rushed to the nearest telegraph office and wired to his wife:

"My gosh, kid, countermand later order, two is plenty."

Electrical Systems In State Institutions

By WALTER M. CALLAHAN, Electrical Engineer, Division of Architecture

A VISIT to any one of the major institutions of the State of California is in most instances quite interesting and novel to one on his initial visit. The impression formed is obviously contingent upon the type of institution; *i.e.*, whether it be a hospital for the insane, a prison, a juvenile mental hospital or corrective institution, or a State

Teachers College. The individual inclinations of the visitor are also to be considered, as one visitor may be interested in the style of architecture of the buildings, another may particularly note the arrangement of the buildings, roads and walks, while still another may



WALTER M. CALLAHAN

observe the actions of the patients, inmates or students. Whatever the impression may be, it will doubtless be prompted by certain definite visible objects which we might refer to as being "on the surface."

THE THINGS NOT SEEN

Within the structures and under the ground of all State Institutions, as well as any other centralized group of buildings or buildings of similar functions, there are items which are necessary to insure safety of building structures, modern conveniences for the occupants, sanitary and other indispensable features, which promote the efficient performance of the functions of the institution. These items are often unobserved by the visitor in spite of the fact that considerable forethought and engineering study is involved in the original design. Such items as a safe structural design, water development and its distribution

for both irrigation and domestic usage, sewage disposal, heating and its distribution, electricity for lighting and power, are all essentials, and all are necessary in making up a complete plant.

ELECTRICAL INSTALLATIONS

Electrical installations in a major State institution consist of many branches, each of which requires considerable study to adapt the system to the routine functions of the institution. The particular application of any electrical system depends largely upon the type of institution. It is in this connection that the Division of Architecture is frequently called upon to develop special systems of electrical apparatus and control in order that a definite function desired by the institution authorities may be accomplished. The past experiences of the Division of Architecture in this regard, together with a general knowledge of the routine functions of the particular institution involved, is of material importance and results in a satisfactory and efficient installation at a minimum cost to the State.

THE VARIED WORK OF LIGHTING

To convey a general idea as to the varied items involved in the numerous branches of the electrical installations, it will be enlightening to briefly consider some of the cases in detail:

1. General illumination is provided in practically every building structure. The type of equipment and intensity of illumination is governed by the type of structure as well as the need of the occupants. This portion of the electrical installations is probably the most diversified of all the branches, as it involves problems in lighting of cell blocks in prisons, class rooms in schools, hospital wards, children's study rooms, and recreational rooms. Floodlighting is, in many instances, used for precautionary purposes in penal institutions and for artistic applications on or around monumental buildings and surrounding grounds. A complete system of grounds lighting is usually provided for all major institutions. Modern stage equipment and lighting is an integral part of all auditoriums in which motion pictures and theatrical performances are shown. Drafting rooms and various testing laboratories which require high intensity, properly diffused, and equal distribution of illumination, are given thorough study and treated so that the eye will function at the maximum degree of efficiency. In fact, every problem of artificial illumination is given thorough consideration and study before a final decision as to the type of installation is reached.

2. The pumping of water, both for domestic purposes and water for irrigation and fire protection,

involves the installation of electric motors and their automatic control equipment.

3. Refrigeration plants play an important role in all institutions for the reason that in practically every instance the institution is somewhat isolated from the centers of population, thus necessitating the storage of food and perishable commodities. It is essential that the electrical equipment used in conjunction with refrigeration be installed in such a manner as to reduce the possibility of failure to a minimum.

4. Laundry machinery and equipment involves a multiplicity of electrical controls for efficient operation.

5. Various local industries which are carried on in the Institutions each require individual investigation. Fruit and vegetable canneries, jute mills, broom and basket weaving factories, shoe shops, printing plants and other minor industrial activities have certain definite requirements for electrical drives and controls.

6. Provisions for telephone, fire alarm and miscellaneous signal systems are provided as required.

7. The item which requires the greatest forethought and study is that which involves the distribution of power, telephone and signal systems throughout the institution grounds, interconnecting all buildings and isolated units under a common main distribution service, originating at a central source of supply. These



Ward-Kitchen-Steam Plant Building at Agnews State Hospital.

services are, however possible, installed underground in fiber ducts encased in concrete which eliminates the expense incurred by the deterioration of overhead pole line construction.

PLANNING FOR THE FUTURE

In contemplating the layout for an underground distribution system, it is advantageous to be aware of the future development of the institution. The ten-year building program, under which the Division of Architecture is now operating, anticipates the future requirements of the various institutions and furnishes pertinent information to be used as a basis for the design of a distribution system. With this information in mind, it is possible to design and provide facilities of sufficient capacity for the ultimate project. This prevents the installation of a series of small individual services to care for the immediate needs, the combined costs of which would far exceed the cost of a single service of sufficient capacity.

Highway Patrol Asks Medal for Brave Rescue by Checker

BECAUSE of heroic conduct displayed in rescuing two persons from drowning in the waters of Donner Lake, Tony Beard, Sacramento Junior College student, employed last summer by the State as a border checker, has been recommended for a Carnegie award from the Carnegie Hero Fund Commission by the California Highway Patrol.

The application of the patrol on behalf of the 21-year-old student has been signed by Governor Rolph, Lieutenant Governor Merriam and other prominent persons and is now being considered by the commission.

Young Beard risked his life on two occasions last summer to pull drowning persons from the lake. On the first occasion he rescued Mrs. Leida Brown from

drowning and revived her after several hours of resuscitation. Evidence was not presented to the commission in this case, however, as witnesses could not be found.

The second incident occurred on August 8th when John Van Ek, Oakland insurance agent, and another man named Warner began struggling in the lake while swimming and sank to the bottom. Beard sprang into the water with his clothes on, broke the two men apart and was dragging Van Ek out when a Negro boy who had arrived in a boat to assist in the rescue sprang into the water and lost control of himself. Beard was then compelled to drag both the Negro and Van Ek to the bank.

The Negro revived but several hours of resuscitation failed to revive Van Ek and he perished, as did Warner.

After applying artificial respiration for an hour Beard collapsed and was unconscious for four hours.

The design of a distribution system also requires negotiations with the public utility companies in order that the rate upon which the cost of electric energy is based will be the one most favorable to the State.

Shade Trees Are Saved in Highway Widening Operations

HERE are news items concerning shade trees along the State highway system that will meet with enthusiastic approval.

The first article, an editorial in the *Stockton Independent*, reads as follows:

Here is cheering news to all tree-lovers of San Joaquin County and particularly those residing in the Lockeford-Clements section.

State Highway Department has announced that it seems likely that not ten of the fine trees along the Lockeford-Clements highway will have to be disturbed in the work of widening and improving the road, which runs from the Waterloo Road to a point one mile east of Clements. Mr. Pierce states that it is the policy of the Highway Commission to preserve trees whenever possible.

Nearly all Stockton people will remember the fine old trees on the Lockeford-Clements road running in front of the W. S. Montgomery place, where about 1000 splendid trees makes a magnificent avenue.

It is gratifying to know that but a very few of the trees will be disturbed, as they are a valuable asset to the county and every means should be taken to preserve them.

The second article is a news dispatch from Bakersfield, and tells the following story:

BAKERSFIELD, Feb. 2.—The Board of Supervisors today, by unanimous vote, made possible the consummation of a plan to adorn with shade trees the highway from the north line of the county to the Famosa crossing, a distance of ten miles, this being the first step in the creation of a shaded avenue from Delano to Bakersfield.

The matter was presented to the board by Alfred Harrell, who reviewed briefly the history of the movement, which he said had its inception in a resolution passed by the Woman's Club of Bakersfield something more than a year ago. In their behalf, the speaker said he had taken up the project with the State, ascertaining that tree planting was stopped because of the narrowness of the right of way, it being necessary to increase the width of such right of way from sixty to ninety feet.

I like to watch the rooster crow,
He's like so many men I know
Who brag and bluster, rant and shout,
And beat their manly chest without
The first damn thing to brag about.

NATIONAL—Traffic planning, regulation and control are advocated by the National Safety Council in speeding up traffic in metropolitan districts during the busy hours of the day.

COLORADO—Over one hundred road building projects involving the expenditure of more than \$6,000,000 are under way in this state. The projects, part of the largest road building program ever outlined in Colorado, are being pushed by highway officials to relieve unemployment.

"ALIMONY SAM," BUDDY OF DIRECTORS IN FRANCE, RENEWS ACQUAINTANCE

(From the San Francisco Call.)

Colonel Walter Garrison, director of public works, and James Herz, his deputy director, were reminiscing over wartime days in France when a man walked into their office and shouted the greeting:

"Hello buddies!"

It was Sam Reid of Willows, former buck private in the 363d Infantry, in which Director Garrison served as major and Herz as sergeant-major.

Reid gained national attention two years ago when he went to jail for several months as an alimony martyr in Glenn County, and since then he has borne the sobriquet of "Alimony Sam."

"Buddies," Sam proclaimed, "I'm broke. I've hardly eaten for the last two weeks. I don't want charity; I want work—anything."

"Sam," Colonel Garrison answered, "all we have is road work, at \$4 a day, and only three days' work a week at that. It's hard labor—pick and shovel—"

"I'll take the job, and mighty glad to get it!" interrupted Sam Reid.

Accident Percentage Higher In Country; Speed Is Cause

INDICATIVE of the fact that excessive speed is a contributory cause to fatal motor accidents, the California Highway Patrol today made public the results of a survey showing that while more accidents occur in cities of the state, the percentage of deaths in the rural districts on the open road is greater than in the cities.

Pointing out that the greater the speed, the greater the chance of death if an accident occurs, the patrol's survey shows that although 50.8 per cent of all fatal motor accidents occurred in cities during the last two years, these accidents account for but 48.9 per cent of the total number of persons killed.

On the rural roads, where the motorist is tempted to exceed the speed limit, 49.1 per cent of the accidents account for 51 per cent of the deaths. The figures show that in cities 1,049 persons were killed per accident where a fatality occurred, while in the country where speeding is indulged in, 1,131 persons were killed per accident.

Collisions at speeds less than 40 miles an hour may or may not result in fatalities, it was stated, but collisions at greater speeds are almost sure to result fatally.

Traffic Enforcement Must Be Consistent If It Is To Be Effective

By E. RAYMOND CATO, Superintendent of the California Highway Patrol

Captain E. Raymond Cato of the Los Angeles police department was appointed recently by Governor Rolph as superintendent of the California Highway Patrol. Captain Cato brings to his new position the experience of more than twenty years as a peace officer and police executive. In this article, he outlines some of the policies by which he will be guided in his new position.

STEADY, consistent enforcement of the traffic laws, unmarked by spasmodic "raids" and "campaigns," will be the policy we shall strive to carry out in administering the affairs of the California Highway Patrol.



Captain E. RAYMOND CATO

We have no sure cure remedies or specifics to offer as a solution of our traffic problems. We believe that as long as motor vehicles continue to run on the public highways we will have traffic problems. At best we can only hope to mitigate the evils that exist by studying these problems carefully and by giving the best that is in us toward making the highways safe.

Therefore, we will "carry on," doing the best we can, hopeful of receiving the cooperation of the motoring public, knowing that 90 per cent of the fight is to awaken the individual driver of a motor vehicle to a sense of his responsibility.

Personally, I can see little merit in emphasizing one kind of enforcement at the expense

of another. We have a tremendous problem in headlight enforcement but we cannot devote all of our time to headlights and let reckless and intoxicated drivers escape. A mixed program with officers on the alert for all types of violations is better, in my opinion.

This does not mean that we are going to ignore the headlight problem. We shall continue to devote one night a week to this work. It is my hope to be able to augment the various squads in time so that we may have sufficient men to keep a regular night patrol on duty all the time.

There is a vast field for study by specialists in the construction of lights. Nothing absolutely satisfactory has been evolved as yet but some one may find a way to keep headlights from getting out of adjustment so easily. When that day comes the problem will have been solved to a large extent.

It will be our policy to keep the major part of our forces on the main-traveled highways. We will work on the theory that more men are needed where there is more travel. In extraordinary cases, such as fiestas, football games, etc, we will not hesitate to avail ourselves of the provisions of the law permitting us to move our men from one point to another.

I do not agree with those who would remove all speed restrictions from our laws and allow the motorists to run wild. I regard a maximum speed limit as absolutely essential. It is too important a matter to be left open for discussion as to what constitutes a safe speed and what does not.

It is possible that some plan might be worked out by the legislature whereby higher rates of speed than are now permitted might be allowed on the open road under some conditions. I do not know whether 40 miles an hour is the maximum that should be allowed but I know some maximum should be established.

As for the patrol, we shall enforce the speed laws as set down in the motor vehicle act.

We shall insist that our officers exhibit the utmost courtesy toward the motoring public. But in doing so they must not overlook offenses endangering life and property. Many cases will arise where it will be entirely up to the officer's judgment to determine

(Continued on next page.)

Model State Highway Maintenance Yard



THE WORK of Highway Maintenance Superintendent L. C. Evans in beautifying the Douglas City, Trinity County, maintenance yard deserves especial commendation.

The yard occupies a site that was originally nothing but a rock pile. In four years Super-

intendent Evans has turned it into a veritable garden. This improvement has been practically no expense to the State and is, for Mr. Evans, a work of love.

The above photographs illustrate, the beauty of this yard. The daughter of Mr. and Mrs. Evans appears in the center.

TRAFFIC ENFORCEMENT MUST BE CONSISTENT IF IT IS TO BE EFFECTIVE

(Continued from page 14.)

what course he shall take. He must be guided by circumstances but in the main his guide is the motor vehicle act and he must deal with violations in a stern manner.

To the men themselves I will say that I am one of your organization in the California Highway Patrol and am for you when trying rightfully to perform your duty.

One thing I will insist upon and that is that members of the patrol keep themselves out of local political fights. The men are servants of the state and not political bosses. As members of the patrol they should have no interest in local politics.

We shall insist that the men pay careful attention to their personal appearance and condition of equipment. An efficient officer

can be noted by the exhibition of his personal pride in this manner.

The patrol has an ideal to attain, a tradition to live up to for it is an intricate part of our state government. We are not living up to the patrol standard if uniforms are allowed to become unkempt or if duties are performed in a slovenly manner.

We ask the cooperation of the men and the motoring public.

STOP, LOOK, LISTEN

He heard the toot, but tried to scoot
And bent the choo-choo to it.
The poor galoot now twangs a loot,
Take heed that you don't do it.

New Yorker (incredulously)—"And you mean to say that in California you have 365 days of sunshine a year?"

Man from Los Angeles—"Exactly so, sir, and that's a mighty conservative estimate."—*Stray Bits.*

Recommendations Made for Irrigation District Financing and Refinancing

AS a result of the study by a commission appointed in the spring of 1929 for the purpose of securing a definite method whereby the financing and refinancing of irrigation, reclamation and other public improvement districts may be put on a better credit basis, recommendations have been submitted to the Legislature which, if approved, should be of the utmost importance to the entire irrigation situation, both from a financial and a public standpoint.

Members of the commission signing the report are Will C. Wood, former State Superintendent of Banks; Edward Hyatt, State Engineer; U. S. Webb, Attorney General of California; Fred W. Kiesel, Sacramento banker; Charles E. Maclean, San Francisco banker; W. P. Jeffries, Los Angeles banker.

Charles L. Childers, El Centro attorney, also a member of the Commission, approved the report with certain reservations. These reservations will be found at the conclusion of this article.

Of primary importance in the majority report is the recommendation for the enactment of legislation which will assist in the refinancing of distressed districts organized under existing statutes and, secondarily, the elimination of such defects in future district organizations as have contributed to failures in the past.

One of the most important recommendations of the commission is that legislation be enacted creating a state irrigation and reclamation bond fund, to which \$5,000,000 shall be appropriated.

STATE RELIEF FUND PROPOSED

This money is intended to be used for the purchase, under certain conditions, of refunding bonds of reclamation and irrigation districts in amounts that will enable the districts to take up that amount of maturing bonds found to be in excess of the district's ability to pay during a year, and which likely would be the chief cause in necessitating a refunding issue. The mechanics of the operation of the bond fund would be placed in motion by application to the California Bond Certification Commission by any irrigation or reclamation

district for relief, on account of a too heavy program of bond maturities.

While the commission finds that fundamentally the present laws are sound, difficulties have been encountered in the operation of these statutes, traceable principally to their application and the lack of adequately supported agencies or means to make them effective, and changes in the laws are strongly advised:

1. To prevent as far as possible unwarranted depreciation in the credit standing of irrigation and reclamation district securities;
2. To establish the confidence of the investing public in these securities, and,
3. To strengthen the individual borrowing power of the land owners within such districts.

LACK OF PUBLIC CONFIDENCE

Primarily, depreciation, lack of borrowing power and loss of confidence may be accounted for by the abnormally depressed conditions of agriculture. This situation has brought to light faults in economic analysis and legislation which under normal conditions would not have developed. The confidence of the investing public in these securities, therefore, has been shaken and the ability of even sound districts to finance through the sale of bonds, under present conditions, is impaired seriously. This skepticism is due largely to the experience of the investor with defaulting securities and is attributed in part, the commission in its report to the governor and the legislature says, to the following:

1. In case of default the laws provide no practical recourse or remedy;
2. Periodical reporting is either not required or is so irregular that accurate district information is frequently unobtainable;
3. Certification by the bond commission or approval by the superintendent of banks, due to lack of personnel, finances, and authority, has not always carried the assurance of a comprehensive study of economic soundness.

Rectification of these difficulties in the case of future bond issues, the commission reports, may be accomplished through legislation supported by adequate appropriation, but the amount of these securities now outstanding, their loss of credit and the rapidly approaching necessity for refunding in many instances,

makes solution or alleviation of existing district difficulties the major problem.

AGRICULTURE HELD BASIC

The commission urges that as agriculture is so basic to this state's prosperity that its success is vital to the welfare of every community within its boundaries, every assistance, other than subsidy, that can be legally given should be rendered.

Details of the commission's recommendations follow:

1. That the California Bond Certification Commission be given power to extend to reclamation districts any privileges now accruing to irrigation districts and that any new privileges added through legislation be applicable to both irrigation and reclamation districts.

2. That personnel of the commission be increased by two members, to be appointed by the Governor, with approval of the Senate, for a period of four years.

3. That \$100,000 for the next biennial period be appropriated for the use of the commission.

4. That the commission be authorized to employ a secretary and executive officer and such experts and assistants as it may deem necessary.

5. That the commission be given wide discretion in certifying any bond issue and not limited in its considerations to the specific factors named in the present laws.

ANNUAL REPORT TO BE MADE

6. That the commission be empowered to make an examination at least once each year, of records, financial affairs and physical properties of districts under its supervision and to publish or require the districts to publish, at least once a year, a report of their affairs, so that district residents, creditors and others may have authentic data concerning the districts.

7. That the commission be authorized to cooperate with any district in working out a refunding program, in case the commission deems refunding necessary.

8. That the commission be empowered to make a thorough investigation and report on the physical, financial and economic conditions of each district going into default, and to take the necessary steps and be charged with the duty of bringing together all interests in a plan of reorganization when it appears that the district will be unable to cure the default within a reasonable length of time.

9. That in case of a default continuing for a year, the commission may, subject to approval of a judge of the superior court of the county in which the district, or greater portion of it, lies, appoint a special agent to keep the district works in order and in operation and to raise money for such purposes in a way to be specified by law.

LEGAL CHANGES OUTLINED

Specific changes in existing statutes are recommended as follows:

1. That the California Irrigation District Act be amended to allow under proper safeguards the redemption of a portion of the land sold for delinquent assessments, in the case of a large tract sold in one block. (This is permissible with county taxes and should assist in clearing up delinquencies.)

2. That the act be amended to allow under proper safeguards the establishment of district sinking or surplus funds and permitting their use for the purchase of unmatured bonds.

3. That the act be amended to allow the district

under proper safeguards to enforce payment of assessments by the refusal to deliver water.

(Public utilities and municipal bureaus now employ this method.)

4. That the act be amended to allow the establishment of a depreciation fund for the replacement of irrigation works.

(This provision was suggested to aid districts with pipe lines and such other works as are comparatively short lived.)

POLITICAL CODE CHARGES URGED

5. That the Political Code be amended to provide that no reclamation district warrants shall be issued unless covered by assessments and that no assessments except for the payment of interest charges and current expenses shall be levied without the approval of the commission.

(The present statute providing for the issuance of warrants is not clear as to the precise status of the warrant, though it is apparent that they are, or may be made, a lien on the properties of the district and to all intents and purposes are in the same status as the bonds. When issued in excessive amounts, they dilute seriously the securities of the bond. In case of foreclosure by the bondholders, the outstanding warrants, if supported by assessments, remain as a lien against the property, which in effect places the warrant in a prior position to the bond.)

6. That the Political Code be amended to provide for the semiannual payment of interest on reclamation district warrants.

(The lack of an interest payment date is a serious banking objection.)

7. That the Political Code be amended to authorize a reclamation district to take possession of, farm and operate or lease such land to which the county treasurer, as trustee of the bond fund, has taken title after sale for delinquencies.

(In case of default in the payment of assessment, the delinquent lands in lien of other bidders are sold to the county treasurer as trustee of the bond fund. The statute now is not clear as to what may be done with the lands thereafter. The treasurer has no power to lease the lands, nor authority to operate them, nor is he provided with funds to prosecute a suit for possession. This situation leads to a loss of revenue to the district and eventually to the bondholders.)

8. That the Political Code be amended to reduce the 20 per cent penalty imposed by reclamation districts which attaches upon delinquency to 10 per cent.

(This penalty has not resulted in the payment of additional taxes, but is almost confiscatory in its severity.)

BOND FUND PROVISIONS

Any refunding bonds purchased through the state irrigation and reclamation bond fund may be sold at any time by the Commission, through which the bond fund will be administered, but in no case for an amount less than the purchase price, and the money received from such sale will revert to the fund. Until the purchased bonds are sold, they will be held in the fund, and all interest received thereon shall be retained in the fund to be used again by the commission for the purpose of assisting other districts to refund their bonded obligations in case of demonstrated need.

When it appears to the commission, after it makes a full and thorough investigation of the affairs of any district that applies to it for relief on account of too heavy a program of bond maturities, that the district can, with a readjustment and extension of the program of maturities, pay off its entire bonded indebtedness within a period of 40 years after voting of the refunding issue, the commission will consent to assist the district through the bond fund. The commission will grant the district permission to vote a refunding issue

(Continued on page 27.)

Road Crew Fight Cloudbursts; Forget Hours to Keep Road Open

FIGHTING CLOUDBURSTS

Oxnard, California January 11, 1931.

Mr. S. V. CORTELYOU,
Dist. Engr., Div. of Highways,
Los Angeles, California.

Dear Sir: The following is a report of storm damage and performance of maintenance crew during the storm of January 7 and 8, 1931. We started with the storm at noon Wednesday, January 7th, to patrol the cliff section, draining water-holes along the pavement and removing falling rocks. At about 3.30 p.m. the storm changed to a cloudburst, and I noticed at the Miller quarry site a large volume of water coming off the portion of the hill that burned early this fall. As there was a large amount of debris along with this water, I stationed one man at this culvert to keep it from becoming clogged with brush and rocks. I took two men and started for Decker Road, as all of my section from the Los Angeles-Ventura line to Decker Road was in the path of the run-off from the burned area.

At Station 158+88 we found the culvert unable to carry the volume of water. We turned as much as possible of the water down the hill to keep from washing the fill opposite the culvert. As the water was subsiding, we left to see what other damage had been done. An average of 18 inches of mud and rocks had been deposited on the pavement for about 60 feet, but was passable for one way traffic.

At Station 221+25 I found the traffic halted. I was informed that the first one

there had been there for nearly one-half hour. There were rocks and mud to the depth of about four feet across the pavement. It took us about 10 minutes to get the largest of the rocks out, and we were able to get the passenger cars through. The trucks had to wait another half hour. I sent word back for all of my men to come over towards Decker Road. At Station 223+86 the traffic had to use the shoulder, and was for one way traffic only. I sent one man back for lanterns and

barriades; the other men I put to cleaning off one half of the pavement. At 10 p.m. I had the road so one way travel could get by all places without difficulty, so I then let part of my men go for supper and the rest of us worked until the others had had their supper and returned. We then went to supper and came back. I had two trucks hauling rocks and mud off the worst places; caterpillar and grader grading the mud to both sides of the pavement where it wasn't as deep.

At 3.30 a.m. Thursday, January 8th, another storm with thunder and lightning came up. At 3.45 a car stopped and said there was a regular river crossing the highway near the county line. I left two flagmen where we were working and took the rest of the crew. We found rock, brush, mud and fencing about 5 feet deep across the pavement and traffic blocked. In one hour we had one way traffic moving on the shoulder; at 7 a.m. we had one-way traffic on the pavement. I then put the crew to cleaning the pavement of rocks too large for the patrolman to get off.

I took the six relief employment men out to improve the one-way passages we had. At

OFFICIAL COMMENDATION

Sacramento, California,

January 27, 1931.

Mr. Glenn H. Cheeseman
Maintenance Foreman
Oxnard, California

Dear Mr. Cheeseman:

District Engineer Cortelyou has informed this office of the efforts made by your crew in keeping a portion of our coast highway open during the severe storm of January 7th and 8th.

I wish at this time to express the appreciation not only of myself but the entire organization for the untiring efforts of yourself and crew in displaying a spirit which should be and is typical of our organization where the care and safety of travel is concerned.

Yours very truly,

C. H. PURCELL,
State Highway Engineer,

By
T. H. DENNIS,
Maintenance Engineer,

9 a.m. my boys met Sullivan's crew cleaning the pavement (they had cleaned from Point Mugu to Pelican Point). I sent the men that had worked all night home for some sleep and to show up at 1 p.m. as it had been raining since we opened one way traffic. At some points more mud had been washed on. We worked until 10 p.m. Thursday, January 8th. The storm was over and we called it a day. Myself and crew that was on worked from 7 a.m. Wednesday, January 7th, to 10 p.m. Thursday, January 8th, with the exception of about 2 hours the boys had for sleep.

The following are the places the mud washed over the pavement, with the station number and approximate amount of mud:

Station 158+88—60 ft. pavement covered at approximately 18 inches deep. Graded to both sides. One-way traffic.

Station 179+52 to station 160+50—Pavement covered 2 feet deep, mud and rocks off Rindge property. One-way traffic.

Station 216+00 to Station 219+00—Average depth rocks and mud 1 foot.

Station 219+50 to Station 221+25—Average depth of rocks, brush and mud 4 feet. Traffic halted 45 minutes.

Station 223+86—Average depth of rocks and mud 3½ feet. One-way traffic.

Station 254+13 to Station 255+13—Mud to depth of 8 inches, washed off Decker Road.

Station 107+00 to Station 107+95—Average depth 4 feet. Traffic halted 1 hour.

Rocks were removed that were 3½ feet in diameter. This damage was due to the burned off area, as in very few cases did this dirt and rocks come near a culvert, but new washes were formed and considerable drainage work will have to be done to keep drainage from every rain from coming on the pavement instead of to the culverts that are already installed.

Yours very truly,

GLENN H. CHEESEMAN.

DISTRICT ENGINEER'S REPORT

Los Angeles, California,

January 20, 1931.

MR. C. H. PURCELL,
State Highway Engineer,
Sacramento, California.

Dear Sir: Attached hereto for your information is copy of report dated January 11th from maintenance foreman G. H. Cheeseman, regarding the emergency work of himself and his crew in keeping open the El Rio to San Juan Capistrano State highway (route 60),

during the severe storm of January 7 and 8, 1931.

You will recall that last summer there was a very severe forest fire which burned all of the forest cover on a very large area in the mountains to the north of this highway. As a result, the storm of January 7th and 8th, which under normal conditions would have caused little trouble, resulted in washing down large quantities of debris over our pavement. Foreman Cheeseman and his crew worked continuously from 7 o'clock Wednesday, January 7th, to 10 p.m., January 8th, 39 hours, with the exception of about two hours off for sleep.

This is the kind of men and kind of spirit which gives such a high standing to our maintenance organization. I think Foreman Cheeseman and his crew are certainly to be commended for this additional example of their fidelity to and interest in their work.

Yours very truly,

S. V. CORTELYON,
District Engineer.

PACIFIC HIGHWAY BRIDGE IS DEDICATED

(Continued from page 7.)

County, I would like very much to have been able to participate in the completion and dedication of this bridge, which marks constructive progress in your two counties and adds another link to our great highway chain.

I take a keen interest in the welfare of your two fine counties. Please give my compliments to all the people attending the ceremonies and say to them that I shall as early as possible return to your counties and visit my fellow citizens who welcomed me so delightfully when I visited them in the recent campaign.

My compliments and good wishes.

Telegram from Colonel Garrison

Colonel Walter E. Garrison, Director of the Department of Public Works, wired Mr. Kelly as follows:

I am indeed sorry that stress of business here makes it impossible for me to be present at dedication of Cottonwood Bridge today. Please convey my regrets to those who attend the ceremony. This bridge will add another scenic feature to Pacific Highway and it will perform a two-fold service hindering the counties and communities of that section closer together and serving outside travel in a better and more attractive manner. Congratulations to you and your friends through whose efforts this important betterment was obtained.

"What became of that unpaid bill Dunn sent to us?" remarked the bank clerk to his wife.

"Oh, that?" she asked. "I sent it back marked 'insufficient funds.'—*Portland Express*.

State Highway Commission Speeds Up Governor Rolph's Highway Building Program

THE California Highway Commission at its meeting in Sacramento on January 29th authorized the necessary appropriations for engineering and right of way expenditures necessary to put Governor Rolph's highway program into immediate effect. The Commission directed State Highway Engineer C. H. Purcell to proceed at once with the preliminary work.

Present at the meeting of the California Highway Commission were Earl Lee Kelly, chairman; Commissioners Frank A. Tetley, Riverside; Philip A. Stanton, Anaheim; Harry A. Hopkins, Taft; Timothy A. Reardon, San Francisco; Colonel Walter E. Garrison, director of the Department of Public Works, and C. H. Purcell, State Highway Engineer.

HIGHWAY ALLOCATIONS

The following allocations were made for highway projects designated for construction upon advice from State Highway Engineer C. H. Purcell that preliminary engineering for these projects was ready for advertising.

Coast Highway: \$931,600 for grading and paving 18 miles between Los Alamos and Santa Maria in Santa Barbara County, including the construction of the Los Alamos Creek Bridge.

Tahoe-Ukiah Highway: \$242,000 for placing oil surface for 19.1 miles between the Abbott Mine and 5 miles west of Williams. This work lies in Lake and Colusa counties, and will complete the improvement of the section of the Tahoe-Ukiah Highway between Calpella on the Redwood Highway and Marysville on the Pacific Highway, with the exception of the Lucerne-Upper Lake section.

San Diego-El Centro Highway: \$240,000 for grading and paving 5 miles between Claydelle Station and west end of Bostonia line change, Las Caches line change and the Flynn Springs line change. This will materially improve the alignment of this highway between El Cajon and Flynn Springs.

San Bernardino-El Centro Highway: \$481,400 for grading and paving 8.3 miles between a point 6 miles north of southerly county line of Riverside County and Avenue 62. With work underway, this project will complete the work of widening the old 15-foot pavement south of Indio to the standard 20-foot width.

El Centro-Yuma Highway: \$150,000 for grading and widening to 20 feet between Highline canal and Sand Hills in Imperial County, a distance of 20.7

miles. With this project and all appropriations of the state highway budget as presented to the legislature by Governor Rolph, the work of widening the entire pavement from El Centro to Yuma to 20 feet will be completed.

Pacific Highway (East Side): \$77,300 for grading and surfacing shoulders for 19.4 miles between Yuba City in Sutter County and Biggs in Butte County. This allocation provides for grading, shoulder work and bituminous surfacing that will provide a 20-foot surfaced roadway in place of the existing 15-foot pavement.

San Fernando-San Bernardino Highway: \$150 for grading and paving the west entrance to San Bernardino, including provision for pavement of state's share of a viaduct. This will greatly improve the state highway entrance to San Bernardino from Los Angeles.

Golden State Highway (Valley Route): \$635,000 for grading and paving 7.5 miles between Tipton Crossing and Tulare in Tulare County. This appropriation also provides for the construction of bridges across Elk Bayon River, Tulare River and Canal. This project with others authorized will complete the work of widening the old 15-foot pavement in Tulare County to 20 feet and will leave only a very small mileage on this route yet to be widened.

San Diego-El Centro Highway: \$106,000 for the construction of the Boundary Creek bridge and approaches and for the Jacumba grade separation, all in San Diego County. This improvement will provide a wider highway on a better and safer alignment through Jacumba with an overhead crossing over the tracks of the San Diego and Arizona railroad.

El Rio-San Juan Capistrano Highway: \$281,300 for grading and paving 3.7 miles between Newport Beach and Corona del Mar in Orange County together with a bridge across the North Channel of Newport Bay. This project will greatly improve the alignment of the section it covers on this very heavily traveled highway.

ADOPTION OF ROUTES

Formal adoption of routes was announced by the commission as follows:

The long mooted question of whether the East-of-the-Sierras highway would pass directly through Bridgeport or bypass that town about 3 miles to the west was settled by the adoption of the Bridgeport routing.

The question of whether the Redwood Highway should pass directly through Crescent City or be routed to Grants Pass about a mile south of the Del Norte County seat was settled in favor of the Crescent City routing.

(Continued on next page.)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
GEORGE C. MANSFIELD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 FEBRUARY, 1931 No. 2

Right of Way Men Find Prospects in Dire Need; Aid Given

THE following letter written by George W. Pulich, right of way agent in State Highway District X to Colonel Walter E. Garrison, director of the Department of Public Works, is self-explanatory:

A very kind and gracious act came to my notice a couple of days ago and I feel it only fair to the men whom you have employed that I give this information to you.

In the work of securing rights of way, Messrs. Malatesta and Perry, respectively, were engaged in their duties and called upon certain people within the outskirts of Stockton for the purpose of signing them on a deed for rights of way being secured on the Hogan Road, between Mariposa Road and Turner Station.

In one particular case the people they interviewed were very poor and at the present time very much in distress. The boys observed the situation and it appealed to their sympathy. Upon coming into Stockton they informed certain friends of theirs and appealed for help for this family. The result was that the next day the family received a sack of potatoes, a sack of onions, half a sack of beans, a gallon of milk, a suit of clothes and pair of shoes for the husband, a dress and pair of shoes and stockings for the wife, and some clothes for the children. Inasmuch as the husband was a member of the American Legion the boys also interviewed the American Legion at Stockton and I am quite sure that further relief will be given this particular family.

I mention this instance because the situation and promptness in which relief was given this particular family appealed to me personally very strongly, and I feel that these boys are deserving of a great deal of credit.

ACTION COMMENTED

The letter was referred by Colonel Walter E. Garrison to C. C. Carleton, Chief of the Division of Contracts and Rights of Way, who addressed the following letter to Louis J. Malatesta and B. J. Perry, as follows:

The attention of Col. Walter E. Garrison, Director of Public Works, has been called to an act of helpfulness rendered by you and your coworker in obtaining

STATE HIGHWAY PATROL TO HAVE MILAN EXHIBIT

THE California Highway Patrol will be represented at the International Exhibition for Safety of Highway Traffic at Milan, Italy, April 12th to 27th of this year.

E. Raymond Cato, superintendent of the patrol, announced today that the patrol had responded to the invitation of the Royal Automobile Club of Italy to participate and would send an inexpensive exhibit.

The exhibit will consist largely of manuals of the patrol, statistical pamphlets and photographs depicting the work of the officers in uniform.

STATE HIGHWAY COMMISSION SPEEDS UP GOVERNOR ROLPH'S HIGHWAY BUILDING PROGRAM

(Continued from page 20.)

The route, as adopted by the commission, provides that the highway shall enter Crescent City at 9th and L Streets.

The Prunedale route for the San Juan Grade relocation was formally adopted.

INCLUSION OF SECONDARY HIGHWAYS

The following resolution was adopted:

Resolved, That the California Highway Commission hereby approves and endorses Senate Bill No. 46, "An act establishing certain additional State highways and classifying them as secondary highways," introduced by Senators Edwards, Breed, Allen, Baker, Cassidy, Duval, Harper, McCormack, McKinley, Riley, Swing and Wagy, and the secretary is hereby directed to transmit copies of this resolution to the Senate and Assembly, respectively.

The highways included in this bill are those recommended by the Division of Highways after a study made under a joint resolution adopted by the last Legislature.

RIGHT OF WAY AGENT

Frank B. Durkee has been appointed right of way agent, Division of Highways, attached to headquarters staff.

prompt relief for certain property owners near Stockton, whom you went to interview concerning right of way but whom you found to be lacking the necessities of life.

The Director has requested me to commend you for the thoughtful and sympathetic initiative taken by you in this situation as such acts do much to "humanize" the routine of State work, besides being of personal satisfaction to yourselves.

Motor Vehicle Registration Shows Three Per Cent Gain in 1930

DESPITE a rather adverse business year, California motor vehicle registrations showed a net gain of 62,325 in 1930. The year's total reached well over the two million mark, being 2,099,293, inclusive of motorcycles and trailers.

The figures show a 3 per cent gain over 1929, not including approximately 36,000 cars registered under the license exempt classification nor the 91,247 cars registered from other states.

Registrations for the year were announced as follows:

Passenger cars, 1,941,969. Solid trucks, 15,500. Pneumatic trucks, 83,887. Motorcycles, 9,405. Solid trailers, 9,563. Pneumatic trailers, 38,969.

The official totals will be used as a basis for apportioning the motor vehicle license fund, half of which goes to the State Highway Department and half to the counties for road building purposes after deductions are made for the expenses of the division and of the California Highway Patrol. Total fees for apportionment will amount to a figure close to \$7,000,000.

TOTAL FEE PAID REGISTRATION OF MOTOR VEHICLES BY COUNTIES, FOR THE PERIOD JANUARY 1, 1930, TO DECEMBER 31, 1930

Counties	Autos	Solid trucks	Pneumatic trucks	Motorcycles	Trailers solid	Trailers pneumatic
Alameda	139,885	1,302	4,509	797	405	1,483
Alpine	90	—	3	2	—	2
Amador	2,422	33	134	5	2	23
Butte	13,574	55	637	40	93	641
Calaveras	2,242	13	110	6	2	63
Colusa	4,276	24	253	7	39	264
Contra Costa	24,329	167	899	173	70	421
Del Norte	1,706	11	132	8	7	63
El Dorado	3,034	22	226	5	7	44
Fresno	53,598	468	2,810	276	515	3,645
Glenn	4,709	30	228	19	83	485
Humboldt	14,691	82	708	62	25	205
Imperial	23,255	59	1,583	69	73	509
Inyo	2,651	11	138	7	4	43
Kern	34,171	235	1,676	177	308	1,663
Kings	9,010	67	42	2	205	841
Lake	3,083	22	198	15	3	61
Lassen	3,798	11	188	14	7	107
Los Angeles	806,264	5,582	30,682	3,289	3,174	8,852
Madera	5,953	33	329	24	39	464
Marin	10,836	107	405	64	5	66
Mariposa	1,192	13	64	1	2	29
Mendocino	7,214	29	171	26	10	65
Merced	13,756	50	731	78	70	938
Modoc	2,926	5	151	6	1	66
Mono	447	1	29	—	—	6
Monterey	19,334	121	1,221	116	89	592
Napa	7,604	97	387	58	41	127
Nevada	2,235	19	175	13	—	25
Orange	47,808	177	2,444	214	711	1,167
Placer	8,755	36	418	33	13	161
Plumas	2,294	18	143	11	7	31
Riverside	28,849	163	1,375	120	298	973
Sacramento	45,137	366	2,429	204	166	977
San Benito	4,175	41	203	34	38	127
San Bernardino	44,858	151	2,258	131	330	977
San Diego	74,866	307	2,678	618	141	510
San Francisco	146,182	3,245	6,461	1,025	339	561
San Joaquin	36,406	336	1,886	191	325	1,656
San Luis Obispo	11,326	43	583	58	39	279
San Mateo	24,427	307	926	137	80	279
Santa Barbara	25,745	86	1,343	143	112	399
Santa Clara	53,840	57	2,258	259	533	1,293
Santa Cruz	14,312	118	812	103	141	313
Shasta	4,986	41	258	16	19	164
Sierra	763	4	37	3	1	5
Siskiyou	8,128	39	427	27	9	145
Solano	13,334	87	530	81	59	290
Sonoma	25,376	227	1,482	138	57	323
Stanislaus	23,840	97	1,331	139	250	1,767
Sutter	5,754	89	305	20	24	324
Tehama	5,126	23	190	16	31	428
Trinity	722	4	34	—	3	11
Tulare	29,165	166	1,612	124	344	2,605
Tuolumne	3,006	16	150	8	5	51
Ventura	20,635	106	1,120	63	209	619
Yolo	9,066	73	570	44	56	356
Yuba	4,725	30	247	9	21	152
Totals	1,941,969	15,500	83,887	9,405	9,563	38,969

First 1931 Snow Survey Data Announced

THE first regular monthly surveys of the 1931 season at the "key" snow courses throughout the State were completed in the last few days of January, and a report issued to present the results of these surveys as well as all of the available data to February 1st from those precipitation stations of the U. S. Weather Bureau, the State, districts, and public utilities located in the mountainous portions of the various stream basins.

It is to be noted that the main survey of all snow courses as a basis for forecasts of stream flow is made in the latter part of March and the present surveys cover only selected or key courses to furnish data in the nature of a progress report. The table printed below presents the results of the snow surveys and affords an opportunity for comparison with the snow pack as shown by the surveys of February 1, 1930, the latter being the first season of the State's entry upon work of this character. In some instances where snow surveys were made for a period of years prior to 1930 by agencies now cooperating with the State, it has been possible to develop tentative "normals" and in these cases the water content of the snow as measured at the first of February is given also in percentage of these seasonal normals.

In so far as generalizations for entire stream basins can be made from the as yet somewhat scattered and limited snow courses, the surveys indicate a water content on February 1st of this year in per cent of the water content at the same time last year, as follows:

Upper Sacramento, and McCloud (one course) 60 per cent.

Pit (one course) 80 per cent.

Feather (3 courses) 50 per cent.

Yuba (3 courses) 105 per cent.

American (3 courses) 90 per cent.

Mokelumne (one course) 60 per cent.

Stanislaus (3 courses) 85 per cent.

Tuolumne (6 courses) 75 per cent.

Merced (6 courses) 100 per cent.

Mono (2 courses) 55 per cent.

Kings (2 courses) 80 per cent.

Kaweah and Kern (one course each) 85 per cent.

Reviewing the data from the precipitation stations, the precipitation to February 1st in per cent of normal is shown for the various stream basins about as follows: Upper Sacramento, Pit and McCloud, 60 per cent; Feather and Yuba, 55 per cent; American, 60 per cent; Mokelumne, 65 per cent; Tuolumne and Merced, 70 per cent; Mono (one station), 60 per cent; Upper San Joaquin and Kings, 60 per cent;

Kaweah, 65 per cent; Kern, 75 per cent; Owens (one station on Bishop Creek), 85 per cent; Upper Valley (one station), 50 per cent; Lower Valley (3 stations) ranging from 10 to 50 per cent; Santa Ana, 70 per cent; San Gabriel and Los Angeles (Mt. Wilson station only, January data for other stations not available to date), 60 per cent.

HUMAN SIDE OF SNOW SURVEYS

The following clipping from the *Redding Searchlight* of January 31st, reveals the method by which these snow observations are obtained:

Breaking in on the solitude of the bleak slopes of Lassen Peak with crunching skis, Norman Brown of the State Highway Department and A. G. Holmes, park ranger, negotiated a level just 600 feet from the top of Lassen Peak yesterday to make a snow survey for the State Division of Water Resources of which H. M. Stafford is director at Sacramento.

Brown and Holmes set out from the checking station about 9 o'clock and took 34 soundings of the snow depth before returning. At Lake Helen there was a level of 86 inches, while at the foot of the volcano peak the measurements showed 96 inches. The density of the snow tested about 45 per cent water.

On the return trip, the men made the distance from Lake Helen to Mineral in just four hours, the total time being 26 hours including their period of sleep at the checking station.

DUG INTO CABIN

Brown stated yesterday that they made a brief stop at Lake Helen, where a cabin was left by the road contractors last summer. They dug their way in and heated a cup of coffee for refreshment. Only one end of the cabin eave was visible when they came upon it.

The men reported only a few snow slides and encountered only one fallen tree on the park highway.

The trip made this week is the first one for the year and the men will make their second visit the latter part of February. The snowfall is not yet equal to last year's total.

"Iceland," said the teacher in the geography class, "is about as large as Siam."

"Iceland," wrote John at examination time, "is about as large as teacher."

DETAIL OF SNOW SURVEY

PROGRESS REPORT OF SNOW SURVEY AND PRECIPITATION DATA TO FEBRUARY 1, 1931.

Drainage Basins and Snow Courses	Elevation in Feet	Depth of Snow, Inches	Density Per cent	Water Content, Inches	Water Content this date last year, Inches
PIT					
Mount Lassen.....	8400	78.6	36.0	28.3	36.0
UPPER SACRAMENTO					
Mount Shasta.....	8000	46.9	32.2	15.1	26.0
MCCLOUD					
Mount Shasta.....	8000	46.9	32.2	15.1	26.0
FEATHER					
Mount Lassen.....	8400	78.6	36.0	28.3	36.0
Mount Dyer.....	7400	18.2	32.4	5.9	
Fredonia Pass.....	6400	9.5	34.8	3.3	
Harkness Flat.....	6400	29.6	31.1	9.2	
Three Lakes.....	6100	16.1	29.8	4.8	13.5
Mt. Stover.....	5500	13.7	32.2	4.4	
Haskins Flat.....	5300	15.1	32.8	5.1	12.5
Feather River Meadows	5000	22.4	34.2	7.7	
Warner Creek.....	5000	16.2	27.8	4.5	
Humburg Summit.....	5000	14.9	29.8	4.4	
Chester Flat.....	4600	11.9	30.2	3.6	
YUBA					
Summit	7020	43.7	34.1	14.9	4.5
		44.7	40.3	18.0	17.0
Furnace Flat..	6000	52.1	32.6	17.0	
		51.5	37.2	19.2	18.5
Lake Fordyce..	6500	42.3	26.9	11.4	0
		43.7	38.5	16.8	15.0
La Porte.....	5000	14.8	45.3	6.7	
TRUCKEE					
Summit	7020	43.7	34.1	14.9	4.5
		44.7	40.3	18.0	17.0
AMERICAN					
Carson Pass..	8600	19.0	31.0	5.9	
		46.0	22.2	10.2	10.5
		39.2	30.1	11.8	21.5
Silver Lake...	7300	13.6	30.9	4.2	
		33.8	24.3	8.2	1
		30.2	29.4	8.9	9.5
Summit ...	7020	43.7	34.1	14.9	4.5
		44.7	40.3	18.0	17.0
CARSON					
Carson Pass..	8600	19.0	31.0	5.9	
		46.0	22.2	10.2	10.5
		39.2	30.1	11.8	21.5
Blue Lakes...	8000	42.4	39.3	12.8	22
MOKELUMNE					
Blue Lakes...	8000	42.4	39.3	12.8	22
STANISLAUS					
Lower Relief Valley...	8300	41.5	29.2	12.1	
		39.7	32.5	12.9	
Soda Creek Flat.....	7900	24.1	25.3	6.1	
		23.7	29.5	7.0	
Upper Kennedy Meadows	7600	22.0	24.6	5.4	
Relief Dam.....	7300	27.6	25.7	7.1	
		25.6	32.4	8.3	8.5
Niagara Flat.....	6500	31.1	23.5	7.0	
		29.5	37.6	7.7	8
Strawberry Lake.....	5700	11.6	29.4	3.4	
		10.7	35.5	3.8	6.5
TUOLUMNE					
Fletcher Lake.....	10300	21.7	32.7	7.1	13.5
Upper Lyell Forks.....	8800	19.2	23.4	4.5	7.5
Tuolumne Meadows.....	8600	27.8	25.6	7.1	12.5
White Wolf Meadows..	8000	44.1	27.2	12.0	13
Gin Flat.....	7100	38.3	41.6	15.7	10.5
Strawberry Lake.....	5700	11.6	29.4	3.4	
		10.7	35.5	3.8	6.5
MERCED					
Fletcher Lake..	10300	21.7	32.7	7.1	13.5
Snow Flat.....	8700	53.5	30.8	16.5	21
Lake Tenaya.....	8150	42.3	28.4	12.0	15.5
Gin Flat.....	7100	38.3	41.0	15.7	10.5
Merced Lake.....	7600	13.4	39.8	5.3	4.9
Pergoy Meadow.....	7000	36.4	30.5	11.1	10
MONO					
Rhinedollar Lake.....	9500	30.6	21.6	6.6	5.5
		34.1	27.6	9.4	12.5
Gem Lake.....	9200	21.6	23.6	5.1	15.5

UPPER SAN JOAQUIN

Drainage Basins and Snow Courses	Elevation in Feet	Depth of Snow, Inches	Density Per cent	Water Content, Inches	Water Content this date last year, Inches
Mammoth Pass....	9500	40.6	31.8	12.9	
Florence Lake....	7200	9.6	20.1	2.5	
OWENS					
Cottonwood Creek....	11100	8.7	20.8	1.8	
Cottonwood Creek....	10600	6.9	20.3	1.4	
Lamarck Creek....	10500	10	11 25	11 2.5	
Sawmill	10200	13.8	26.7	3.7	
Big Pine.....	10000	12.8	19.5	2.5	
Rock Creek.....	10000	12.5	22.4	2.8	
Big Pine.....	9800	8.9	20.1	1.8	
Big Pine.....	8700	9.9	17.4	1.7	
Mammoth Pass....	9500	40.6	31.8	12.9	
North Lake.....	9500	2	No Meas.	No Meas.	
Rock Creek.....	9050	10.3	18.5	1.9	
Minarets	8600	22.4	30.8	10.0	
Mammoth	8300	18.7	28.4	5.3	
Minarets	8300	20.4	28.9	5.9	
KINGS					
General Grant....	6600	16.2	38.9	6.3	8
Cliff Camp.....	6300	18.0	26.5	4.8	6
KAWEAH					
Panther Meadow....	8650	44.9	27.8	12.5	
Hockett Meadow....	8600	41.7	31.2	13.0	
Giant Forest.....	6500	24.1	28.2	6.8	8
KERN					
Round Meadow.....	9000	31.0	29.7	9.2	12 11

BRIDGING SHASTA CANYON MARKS MONUMENTAL HIGHWAY UNDERTAKING

(Continued from page 5.)

the section of highway being reconstructed. It consists of four 80-foot and two 72-foot reinforced concrete girder spans supported by concrete piers and towers. No unusual features were encountered in the construction of this bridge with the exception of the daily rise and fall of five or six feet in the stream flow. This variation added to the hazards and expense of constructing the footings and piers. This bridge when complete will cost approximately \$80,000.

DEDICATIONS TO PIONEER STAGE DRIVERS

An interesting feature of the project is the plan to dedicate these bridges to the memory of the pioneer stage drivers of Siskiyou County. The project accordingly not only links together the great states of the Pacific Coast in a closer bond, but it also serves as a fitting monument to the brave men who, driving over rough, rocky, steep and dangerous roads, blazed the trail for the modern highways over which, daily, thousands of automobiles now travel in complete comfort and with perfect delight.

Insurance companies last year paid out approximately three hundred million dollars as a result of highway crashes. Casualty, life and fire insurance companies all contributed to this huge sum, with casualty companies bearing the heaviest part of the burden. A large part of the total was paid out as a result of personal injuries, fatal or otherwise.

Road Machinery is Playing Larger Role in Road Building

By C. H. PURCELL, California State Highway Engineer *

THE work of the California contractors on highway construction during the past year has been of especial interest as a study in the use of modern machinery and its possibilities in economical highway construction operations.

To state that the financial depression is the sole cause of lower bids now received on construction work indicates a lack of knowledge of the modern contractor's method of operation.

Our contractors today are doing more work with less labor and getting a greater output than ever before with far greater effects on production costs than Wall Street could ever exert; new records for output are being made not for one day's run to be followed by a profit-destroying breakdown, but time after time the average daily production for a whole project is exceeding figures considered impossible a few years ago.

RECORD IN ASPHALT PAVING FIELD

In the asphalt paving field, we have the record made last year of more than one thousand tons daily output by a four thousand pound mixer on the production of some forty thousand tons. This was made possible in the first place by the use of the mechanical spreader and raker, originally developed in California, to take care of the tonnage, and second by the elimination of all lost motion in plant operation. The time clock with its bell was originally brought out to insure full mixing time on concrete paving machines. Last year, a California firm attached one of these timers onto the asphalt plant with the result that not only were all batches correctly timed but production immediately jumped and now, on most of the contracts this device is being installed although its use has never been specified.

On Portland cement paving work, a run of over four hundred yards with a six-sack mixer is not the exception but rather the rule. Improved batching and charging with properly organized mechanical finishing has insured continuity of operation. An unusual example

of efficient operation was shown this year when two mixers in tandem averaged well over 800 cubic yards per day.

In grading operations, a total of twelve hundred yards or more in eight hours for a yard and a quarter shovel has become a common occurrence rather than a record breaking performance. In connection with this, it should be remembered that the excavated material is not merely pushed over a bank as was once done, but when hauled to the fill is spread in thin layers, watered and rolled.

BEST IN MACHINERY NECESSARY

Such productions are the outcome of the finest organization using the best machinery that can be had. To secure them, everything must "click" from start to finish of the work. They have never been secured in any case by sacrifice of quality of the work, deviating from the specification requirements, or deduction from the value of the finished product. Each year shows more value given, our pavements are built smoother and our laboratory tests show increasingly excellent results.

It has been a source of satisfaction that throughout the enormous volume of work handled by the contract method, the Division of Highways has received the full cooperation of the contractors doing the work. With two hundred twenty-five contracts in the past year and a half totaling about twenty-eight million dollars, the disputed claims on the work have been at a minimum. This condition, so essential to the successful carrying out of California's highway program, requires the harmonious effort of all parties concerned. Every contractor properly labors to conduct his work to produce the greatest possible profit; our work today demonstrates that, in striving to improve himself to produce that profit, he has not only worked for his own advantage but also for the benefit of the people whom he serves.

At a time when economical quantity production of work by the use of the highest type of machinery is so essential to a contractor's welfare, as well as the economical production of work for the State, it becomes of vital importance that a contractor earn a net

(Continued on page 28.)

* This article was written for Pacific Constructor and appears in the A. G. C. Convention Number of that magazine.

Court Okehs Revenue Bonds Issued Under Joint Highway District Act

THE DECISION of the appellate court upholding the action of the board of directors of Joint Highway Number Six in issuing revenue bonds is reprinted below. The decision of the court has been awaited with interest by counties all over California, who are interested in road construction through Joint Highway District Act.

Joint Highway District Number Six is made up of Kern, Ventura and Santa Barbara counties. It was organized to build a highway from Maricopa to Ventura.

Revenue bonds in the sum of \$550,000 were issued, to be repaid over a period of eight years, from taxes levied by the counties in the joint highway district to meet the cost of constructing the road. These revenue bonds were attacked as invalid. The validity of the bonds was upheld in the superior court of Ventura County and the decision of this court was affirmed in the following decision of the appellate court:

IN THE DISTRICT COURT OF APPEAL OF THE STATE OF CALIFORNIA, IN AND FOR THE FIRST APPELLATE DISTRICT, DIVISION TWO.

J. M. SHARP, Plaintiff and Appellant, vs. JOINT
HIGHWAY DISTRICT No. 6, etc., et al, De-
fendants and Respondents.

Claiming that the defendants were about to issue a series of illegal "revenue bonds," the plaintiff commenced this action to obtain an injunction against the defendants restraining them from further proceeding with the issue. The defendants answered and a trial was had before the trial court sitting without a jury. The trial court made findings in favor of the defendants and from a judgment entered thereon the plaintiff has appealed and has brought up typewritten transcripts. The case arises under an act of the legislature known as "Joint Highway District Act," Chapter 52, Statutes 1917, as amended in 1921, 1925, and 1927. (Here follows a detailed description of the operations of the act.)

The first point which the plaintiff makes is that he adopted the proper remedy. The defendants do not dispute the claim except to assert that the plaintiff has no cause of action.

In his second point the plaintiff claims that the bond issue is void because it is prohibited by the provisions of section 18, Article XI of the State Constitution. A State Legislature has such powers, in these matters, as are not prohibited by the constitution. A bare reading of the section cited shows that it does not contain any prohibitions directed to such an entity as the defendant district. (See also *In re Madera Irrigation District*, 92 Cal. 296, 342-343.)

In his third point the plaintiff claims that the issuance of bonds can not be justified under the authority of a special assessment district because the proceedings would deprive the plaintiff of his property without due process of law. He quotes many of the provisions of the statute which we have epitomized and then he cites *Gadd vs. McGuire*, 69 Cal. App. 347, and contends that the statute gives him no opportunity to state his objections, gives him no hearing, and operates

to deprive him of his property without due process of law. The defendants reply that if the statute provides for due notice and a hearing at some time in the proceedings the parties interested may not complain (*Henshaw vs. Foster*, 176 Cal. 507, 514-515). They also assert that the plaintiff was represented in the legislature that enacted the enabling act and he was represented by his supervisors, one of whom acted as a member of the local board which initiated the proceeding, and that he has had all of the notice that the law requires (*Gadd vs. McGuire*, 69 Cal. App. 347, 363; *Allied Amusement Co. vs. Bryan*, 201 Cal. 316). Furthermore the power to build and pay for roads is one of the powers which is vested in the local board of supervisors. Many county roads are built to the county line, there to be met by a road to be built by the adjoining county; however, no taxpayer would claim the right to be given any notice, regarding such construction, different than the notice regarding other road expenditures. Continuing the defendants claim that Joint Highway District No. 6 is a quasi municipal corporation and not an assessment district and therefore no additional notice was necessary. (*In re Orosi Public Utility District*, 196 Cal. 43, 50.) With this claim we understand the plaintiff disagrees. He claims the statute is but a subterfuge, that the powers to be exercised are merely those powers which, under general statutes now rest with the several boards of supervisors, and that the entire statute is but a sham for giving some support to the issuance of the bonds. But we can not so hold. Let us consider a supposititious set of facts. Let us assume that the total mileage is twenty-five miles; that ten miles lie in the county of A and that the cost of construction is \$5,000 per mile; that ten miles lie in the county of B and that the cost of construction is \$4,500 per mile; and that five miles lie in the county of C and that the cost of construction is \$150,000 per mile; and, that if constructed, such road would be highly valuable as an outlet to each and every one of said counties. It is clear that, as to the county of C the cost may be prohibitive. However, spreading the cost over three counties the cost may not be prohibitive, and the benefits may greatly outweigh the pro rata costs of construction. Under such

facts it is clear that a statute authorizing cooperation is not necessarily a subterfuge. The solution of the doubt, if any, rested with the legislature and not the courts. (*In re Madera Irr. Dist.*, 92 Cal. 296, 309-310.)

Finally the plaintiff asserts that the defendant district has no valid existence as a taxing agency and therefore it has no authority to issue bonds based upon a nonexistent taxing power. This is not a proceeding in quo warranto and there are no allegations showing that the defendant district has not complied with every provision of the statute. The point is, therefore, but another claim that the statute is invalid. The plaintiff cites and relies on *People vs. Van Nuys Lighting District*, 173 Cal. 792. The case is not helpful. In that case the court held that the defendant was not authorized to operate beyond the confines of certain towns and villages and that the relator's property did not lie within the confines of such towns and villages. He also quotes from *Fallbrook Irrigation Dist. vs. Bradley*, 164 U. S. 112, 174, showing that after the organization of the Fallbrook District would be completed it would " * * * almost necessarily be followed by and result in an assessment upon all the lands included within the boundaries of the district." That feature is not present in the instant case. The statute before us does not necessarily imply that assessments will be levied on individuals and the record discloses that the defendant board has passed a resolution that none will be made. For the purposes of this decision we must assume that said resolution is true and that it was passed and adopted in good faith. When assessments in fact are to be made on private holdings, the statute provides that notice must be given and a hearing must be held to ascertain the amounts of benefits if any.

We find no error in the record. The judgment is affirmed.

STURTEVANT, J.

We concur:

NOURSE, P. J.
SPENCE, J.

RECOMMENDATIONS MADE FOR IRRIGATION DISTRICT FINANCING AND REFINANCING

(Continued from page 17.)

for such part of the outstanding bonded indebtedness as the commission estimates should be refunded. The refunding bonds will bear interest not exceeding 6 per cent and will be exchanged at par or be sold at a price approved by the commission.

Refunding problems of meritorious reclamation or irrigation districts should be greatly simplified if the irrigation and reclamation bond fund is voted and with the recommended tightening of the supervisory structure in operation, the credit standing and position of the entire irrigation and reclamation system should be placed on a more dignified level.

Reservations by Mr. Childers to Charles L. Childers made certain reservations to the report in the following statement filed by him:

I concur generally in the report of the majority of the commission but can not concur in recommendations 1-5 and 1-6 and the statements based upon them.

Recommendation No. 1-5:

An examination of the defaulting districts discloses that most if not quite all of them should not have

been organized in the first place and in the light of the information that has been acquired over the last twenty years mistakes in this regard are not likely to be made in the future, particularly if the Bond Certification Commission has sufficient authority to consider every phase of a new district. It does not seem practicable to make a thorough and exhaustive investigation of all conditions of such a district prior to organization, but when the district first applies to the commission for certification of its bonds the commission can and should make an exhaustive study of the new district and consider all questions that might lead to success or failure and certify its first bond issue only after the commission is thoroughly satisfied that the district has within it the necessary elements of success.

After the district is organized and has passed the commission on its first bond issue and is an active going concern, then the powers that the commission has at the present time are quite ample for all purposes. The people in a district once in a going condition are ordinarily better qualified to determine its ability, its limitations, and its needs than a commission wholly out of touch with the district excepting through its representatives and investigators.

At the present time the commission is required to report on nearly every phase of district activity when a proposal is submitted to it for the issuance of bonds and it is authorized to certify such bonds only after the commission shall have found that the irrigation system of the district and the specific project for which the bonds under consideration are desired are feasible and that the aggregate amount of the bonds under consideration, together with all other outstanding bonds, including those authorized but not sold, does not exceed 60 per cent of the aggregate market value of the lands within the district and of the water, water rights, canals, reservoirs, reservoir sites and irrigation works owned or to be acquired by the district. These are broad powers. They are sufficiently broad to prevent an improvement or excessive bond issue and yet sufficiently limited so as not to wholly deny to the people within a district that is an active going concern, the right of self-government.

Recommendation No. 1-6:

I believe the commission should have authority to make, verify and approve reports of the several districts in addition to those now required by law. I doubt the wisdom of making such general reports compulsory. Whether or not the district's credit standing might be injured for lack of such report should be left to the district to decide so long as it is an active going district, meeting its obligations. If the district goes into default, that is covered by recommendations 1-8 and 1-9.

As a substitution for recommendations 1-5 and 1-6 of the commission, I would suggest:

Recommendation No. 1-5:

That the commission be given wide discretion in certifying the first bond issue of any district and not be limited in its considerations to the specific factors named in the present law, but the powers of the commission remain as now provided by law in the consideration of any bond issues after the first.

Recommendation No. 1-6:

That the commission be authorized and empowered upon the written request of any irrigation district to make an examination of the records, the financial affairs, and the physical properties of such district and to publish or authorize such district to publish a report of its affairs approved by the commission.

Unique Highway Sector is Opened With Celebration

THE opening of a section of the Foothill Boulevard through Claremont, a co-operative State and County project, was the occasion for a community celebration.

Approaching Claremont from the east and Indian Hill Boulevard from the west the motorist is introduced to a spacious boulevard with two highway lanes approximately a mile



District Engineer Cortelyou preparing to break the tape, opening the road.

and a half long, separated by a mall between 13 and 20 feet in width. This project extends from the Los Angeles-San Bernardino county line, through the city to Mountain avenue on the west.

UNIQUE FEATURE

But the unique feature in the project is the provision made for handling local traffic.



Speaker: Mr. Gill. Claremont High School girls on left and Boy Scouts on right.

Although two streets with the mall in the center have been constructed, the city has

been given setbacks by property owners on both sides of the boulevard, providing room for additional streets to be built when traffic needs demand them.

The present two thoroughfares are constructed to the ultimate width of Foothill Boulevard as a State highway, which is 76 feet of paving. Setbacks for local roads were established in order that no building will be erected which later would prevent construction of by-passes when needed.

The plan is said to be the only one of its kind in this region, highway engineers state. The local project was started nearly a year ago and has been finished only a few weeks. The cost was approximately \$100,000.

It is pointed out by S. V. Cortelyou, State Highway Commission engineer, that when the entire project is completed Claremont will have a four-lane highway with two by-passes 35 feet wide, separated from the main 38-foot-wide arterials by two planted safety aisles 10 feet in width. The two main traffic arterials are separated by a mall 16 to 20 feet in width.

A unique and beautiful planting program for the highway has been evolved by Ralph D. Cornell, landscape architect of Pomona College.

The central mall will be planted to low shrubs with ornamental lights located in this section. The two smaller malls separating through traffic ways from local by-pass streets will be planted to low shrubs and eucalyptus trees. This program will result in a beautiful highway of four lanes with four rows of eucalyptus trees with the central mall planted to low shrubs, offering southern California one of its most scenic boulevards in any incorporated area.

ROAD MACHINERY IS PLAYING LARGER ROLE IN ROAD BUILDING

(Continued from page 25.)

amount on his work that he is able to take advantage of the rapid development and improvement of machinery. A contractor who does not properly amortize his equipment and accumulates used equipment, which has not been written off, will not be able to compete and remain in this business any length of time.

I do not believe there was ever a time since the original development of the steam shovel when it has been so essential for a contractor to take into consideration his equipment account and to be certain that he is not exaggerating his net profit statement on each project by failure to make the proper equipment write off.

Highway Interests Seek Uniformity in Specifications for Asphalt Road Oils

By THOS. E. STANTON, Research Engineer, Division of Highways

ON February 2 and 3, 1931, Maintenance Engineer T. H. Dennis and the writer attended a conference of the United State Bureau of Public Roads, State Highway Department Officials, and asphalt producers in Salt Lake City. The meeting, one of a series of five throughout the United States, was arranged by the United States Bureau of Public Roads and the Asphalt Institute for the purpose of reaching an agreement on uniform methods of specifying the liquid asphalt products commonly known as



THOMAS E. STANTON

road oils and cutback asphalts.

An analysis of the 1929 eastern state specifications for materials of this class brings out strikingly the needless and uneconomical lack of uniformity in the specifications in use and suggests forcibly the great desirability of a concerted effort to correct the condition that has developed by the uncoordinated action of the various states.

In the west, which is the mother territory of light oil road construction, a number of conferences have been held during recent years between state highway representatives and the asphalt producers. These conferences have brought about a greater uniformity in specifications and methods of test than exists

in the east. However, there are still a number of points in controversy which can probably be settled through concerted action on the part of all parties interested.

There is no doubt but that conferences of this nature are very beneficial, particularly as they afford an opportunity for the technical staff of our road building bodies to get together and go over mutual problems with the producers of the materials used in construction.

The conference unanimously agreed that:

1. All producers should submit to the states prior to March 1, 1931, samples of their products to meet state specifications in which they, the producers, are interested.
2. The states to, as soon as possible thereafter, test the samples submitted for conformity with their state specifications and also according to the approved scheme of analysis.
3. The states prior to September 1, 1931, to test according to the approved scheme a sufficient number of deliveries of materials meeting their own specifications to cover the range in characteristics likely to occur in each type of material.

Following the conference a meeting was held of the Western Section of the Committee on Materials of the American Association of State Highway Officials, of which the above signed is chairman. This committee meeting was attended by members from the following western states represented at the conference: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah and Wyoming.

Representatives of the following oil companies were also in attendance: Standard, Union, Shell, Gilmore and Richfield companies of California, Standard Oil Company of Indiana, Utah Oil Refining Company of Salt Lake City, Utah, and White Eagle Oil Company of Casper, Wyoming.

A general discussion was had of the light asphaltic road oil and cutback plant and road mix construction problems of the west.

All present were very much interested in the extensive investigational work which is being carried on in California in this line of work. California as the pioneer in light oil mix road construction is looked to as a sort of father adviser in such matters by most of the western states.

California is kept on its toes, however, by the work which is being done by Arizona, New Mexico, Oregon, Utah, and in fact, all of the western states which are taking a very live interest in the subject.

Parson: "Why do you desire to join the church?"

Rastus: "Pahson, I've got a job puttin' Mule-Hide on a chicken coop and fencing a watermelon patch, and I needs strengthenin'."

Progress Report of Activities

In the

Division of Water Resources

AS OF FEBRUARY 1, 1931

EDWARD HYATT, Chief of Division

Irrigation District Activities



Applications for
Approval of
Dams

Flood Control and Reclamation



Reductions in Re-
quests for Water
Permits

IRRIGATION, WATER STORAGE DISTRICTS

Preparations have been completed for assembling and correlating data relating to the activities of California irrigation districts during 1930.

The El Dorado Irrigation District, located in El Dorado County, was visited in connection with the progress of construction work made on the Webber Creek dam. Visits were also made to the El Camino Irrigation District, located in Tehama County, and the Oakdale Irrigation District, located in Stanislaus County, for the purpose of consulting on matters connected with the economic operation of these districts.

The petitions of Nellie Blayney et al., for the exclusion of a total of 1584 acres of land from the Tulare Lake Basin Water Storage District, were denied by the State Engineer.

Contract between the Richvale Irrigation District, Butte County, and the Sutter-Butte Canal Company, for the purchase from the latter of certain water rights and properties, has been approved by the California Bond Certification Commission and consent given to proceed with a bond election in an amount of \$515,000 to furnish funds for consummating the deal.

The commission has also recommended for certification a bond issue of the El Nido Irrigation District, Merced County, in the amount of \$135,000.

DAMS

The activities of the department have been directed during this period not only to studying and inspecting existing dams, with a view to their approval, but also very largely to new construction and repairs.

To date 735 applications for approval of existing dams are on file; 58 applications for approval of plans for the construction or enlargement of dams; and 120 applications for approval of plans for the repair or alteration of dams.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR SPECIFICATIONS FOR CONSTRUCTION

Dam	County	Owner	Estimated Cost
Chatsworth	Los Angeles	City of Los Angeles	\$861,228
Santiago Creek	Orange	Soriano and Carpenter Irrig. Districts and the Irvine Company	700,000
Rye Grass Swale	Modoc	W. B. Graves	1,750

The Santiago Creek Dam will be an earth fill structure, 110 feet in height with a storage capacity of 25,000 acre feet.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR REPAIR OR ALTERATION

Seven such applications as have been received during this period are in response to suggestions relative to work necessary to put dams into shape for approval.

PLANS APPROVED FOR REPAIR OR ALTERATION

Dam	County	Owner
Lower Roberts	Modoc	H. M. Roberts
Porter	Modoc	Pearl F. Porter
Dingee	Alameda	East Bay Municipal Utility District
Lower Howell	Santa Clara	San Jose Water Works
Webb Flat	Modoc	Gerig Bros. et al.

The department is taking final steps toward issuing certificates of approval for a large number of dams under its jurisdiction. Final checks are being made on the spillway capacities, adequacy of design and actual condition of the dams as they exist today. Within a short time certificates on such dams as have met all requirements will be issued.

* Amending application of February 15, 1930.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The work of clearing second growth timber in the by-passes has been proceeding with an average of thirty-four men, employed three days per week each. Repairs to the current controlling structure in the upper Tisdale by-pass have been completed. This consisted of driving about 100 feet of sheet pile and timber wall and strengthening and guying portions of the existing timber structure. In the Sutter-Butte by-pass a small barrier in a cross slough has been completed, involving the driving of 22 piles. Routine maintenance work on other portions of the project has been carried on.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

The construction of one tree current retard in cooperation with Reclamation District No. 70 at the Yates place approximately four miles south of Meridian, and the timber mat protection at Girdner Bend for the same district have been completed.

Bank protection work on Andrus Island at the Reardon ranch in cooperation with Reclamation District No. 556 and the Division of Highways has been completed.

Work is now under way on a small job in cooperation with Levee District No. 3 in Glenn County, consisting of placing tree and brush protection.

A similar job in cooperation with F. E. Biggs on the Feather River at Hamilton Bend has been completed.

With the completion of the work for Levee District No. 3 in Glenn County, all bank protection work contemplated for this season has been completed.

SACRAMENTO FLOOD CONTROL PROJECT

Clearing in the Sutter, Butte-Slough and Tisdale by-passes in connection with the flood control project construction terminated about January 1st, when the available funds were exhausted.

The deputy in charge of flood control and reclamation attended one meeting of the Reclamation Board and one meeting of the flood control construction committee. Several reports on applications have been rendered to the Reclamation Board.

EMERGENCY FLOOD CONTROL AND RECTIFICATION OF RIVERS

At Twitchell Island the bank has been sloped ready to receive protecting rock, which will be placed this week along a length of 600 feet. This is in cooperation with Reclamation District No. 1601.

SALINAS RIVER

The suit as to the right of the State to excavate a channel from the Salinas River into Elkhorn Slough is now in court and a decision is not expected before March. The dragline excavator has been released, but another machine will be brought in if a favorable decision is obtained. This work is being done for the Division of Fish and Game.

MOKELUMNE RIVER

Work is being continued on the improvement of the flood channel of the Mokelumne River, in collaboration with San Joaquin County and in charge of our foreman. A crew of thirty men is operating, each working four days per week. A choke in the flood channel is being relieved by the construction of a small levee 1000 feet long and the removal of the existing levees on the McCauley estate.

RUSSIAN RIVER JETTY

The unusually heavy winter storms have continued during the past month and have caused additional damage to the jetty and track on the Russian River at Jenner. Five timber bents at the outer end of the jetty have been removed and the track was damaged. The work of repair has proceeded with the fund furnished by the Fish and Game Commission, involving the relocation of the track to a higher position. The track is now in order and delivery of rock to the jetty will commence at once.

FLOOD MEASUREMENTS AND GAGES

Preparations are complete for taking flood measurements in the various channels during the winter and the recording gages operated by this office are functioning. An automatic water stage recorder has been installed in the Cosumnes River at the State highway.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

The general financial depression during the past year has been reflected in the reduced number of

applications to appropriate. Only 336 applications were received during the year as compared with an annual average of 537 over the preceding ten years. This falling off in applications received has afforded an opportunity to clear up back work and the close of the year found only 493 pending applications as compared with an average of 761 at the close of each of the ten years preceding.

During December, 1930, 18 applications were received, nine canceled and 18 approved; nine permits were revoked and 18 licenses issued.

Preparation of inspection reports covering projects inspected during the past season is progressing. Of the 181 inspections made reports have now been completed covering 89.

The annual reports of permittees covering progress are coming in satisfactorily. Upon the 1313 requests for reports which were mailed 1052 returns have already been made, and upon the 259 requests for reports addressed to licensees 232 returns have so far been made.

In order to obviate in so far as possible the issuance of permits which might conflict with the purposes contemplated in applications filed under the provisions of chapter 286, Statutes of 1927, in support of the general coordinated plan for the development of the State's waters, a map has been completed showing in detail the layout proposed under State filings and a procedure has been developed for checking all other applications received prior to permit against this map for determination of possible conflicts.

ADJUDICATIONS

Shasta River (Siskiyou County)—Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties)—Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All-American Canal from Colorado River.

North Cow Creek (Shasta County)—Referee's final report was filed in the Superior Court of Shasta County on December 18, 1930. This case is now awaiting the court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County)—Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County)—Case pending in Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County)—Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County)—Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County)—The report of referee was filed January 10, 1931, in the Superior Court of Modoc County. The court has fixed February 2, 1931, as the date for filing exceptions to the report of referee, and February 23, 1931, as the date for hearing exceptions.

Mill Creek (Modoc County)—The report covering the administration of the tentative schedule of allotments which was authorized for the 1930 season is approximately 40 per cent completed.

Deep Creek (Modoc County)—The report covering the field investigation of water supply and use of water made during the 1930 irrigation season is approximately 90 per cent completed.

Franklin Creek (Modoc County)—The data collected in the field during the 1930 irrigation season

have been assembled and analyzed, and a schedule for trial distribution during the 1931 irrigation season is being prepared.

WATER DISTRIBUTION

The reports on water master service on Clover and Oak Run Creeks (Shasta County) for the 1930 irrigation season have been completed.

Office work in connection with the reports on water master service for the 1930 irrigation season on Davis, Emerson, Mill, Owl and Soldier Creeks (Modoc County), Burney and Hat Creeks (Shasta County), and Lower Shasta River and Little Shasta River (Siskiyou County) has proceeded during the month.

CALIFORNIA COOPERATIVE SNOW SURVEYS

During the past month the work on this project has been confined entirely to the office. As previously reported, all plans have been made, the personnel has been selected, shelter cabins stocked, equipment and forms distributed, etc., in complete readiness for the 1931 surveys.

The office work has comprised compilations and computations necessary to keep all precipitation records to date (these come in regularly once a month from all stations) and to prepare for the correlation of snow survey and precipitation data with run-off when the data from the surveys become available.

Monthly surveys at the "key snow courses" will commence at the latter part of January and the first of the monthly snow survey bulletins will be issued early in February. Similar to last year this bulletin will present all of the snow survey data for the key course surveys and all precipitation data to date as received from all stations.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Except for the regular salinity observations and tide gage maintenance, the work of the past month has been confined entirely to the office. As previously reported, the regular field work was completed early in November. The office work covers all computations necessary in the preparation of the report for the 1930 season covering all diversions, stream flow, return flow, etc., throughout the Sacramento-San Joaquin territory.

Salinity investigations in the Sacramento-San Joaquin delta and bay regions have been continued through the maintenance of sampling at 31 stations. During the past month the sampling at six stations was discontinued as the salinity at these stations had reached a constant minimum and further observations were not required. Maintenance of eight tide gages has been continued. These are located at Sacramento, Walnut Grove, Georgiana Slough, Sacramento and San Joaquin ends of Three Mile Slough, Mossdale, Antioch, and Collinsville. The following are comparative salinity data for 1929 and 1930:

Station	Salinity in parts of chlorine per 100,000	
	12/30/30	12/30/29
Bullhead Point.....	980	560
O. and A. Ferry.....	440	21
Collinsville.....	125	4
Antioch.....	45	5
Jersey.....	7	5
Emmaton.....	7	2
Webb Pump.....	7 1/2	10 1/2

¹ December 10th.

WATER RESOURCES

VENTURA COUNTY INVESTIGATION

This investigation continued in a routine way throughout the month. Arrangements were made with the U. S. Geological Survey to aid in placing a better grade of registers at five of the important gaging stations. Preliminary arrangements were made also for a geological examination and drilling of the 12 to 15 reservoir sites in the headwaters of Piru, Sespe and Ventura Rivers and for the survey of such sites as have not yet been surveyed.

MOJAVE RIVER INVESTIGATION

The cooperative work of the division of Agricultural Engineering, Department of Agriculture, on transpiration was begun. This will make possible an estimate of the amount of waste without waiting a number of years for actual records of stream waste.

SOUTH COASTAL BASIN INVESTIGATION

Heretofore due to lack of funds this work has been carried on with only two men in the field but with funds now available the force is being increased immediately to about twelve engineers and geologists.

SANTA CLARA INVESTIGATION

Wells previously measured in connection with this investigation were remeasured during the month and seven new wells were established and read in the vicinity of Palo Alto and Los Altos.

The progress report for the past year was completed and will be available for distribution within a few days.

NAPA VALLEY INVESTIGATION

Measurements for the purpose of determining accretions and percolation were made during the month on both Napa River and Conn Creek, and the reading of wells was completed for the low stage of this season.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month. The progress report for the year ending September 30, 1930, has been completed.

WATER RESOURCES REPORTS

Practically the entire staff of the division formerly engaged on investigations in the Sacramento and San Joaquin Valleys, the salt water barrier and salinity conditions and in portions of southern California, in furtherance of a coordinated plan for the conservation, development and utilization of the water resources of the State, as provided in chapter 832 of the Statutes of 1929, has been concentrated for the past two months upon the preparation of reports covering the results of investigations made by the Division of Water Resources. Every effort is being put forth to complete these reports at the earliest possible date.

MISCELLANEOUS ACTIVITIES

A final check is being made in connection with the investigation of lands riparian to the Sacramento and American rivers. This includes a careful comparison between the riparian areas as determined and the original Spanish Grants, Swamp and Overflow Surveys, and Land Office patents.

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED,
AS OF FEBRUARY 1, 1931—OTHER ACTIVITIES OF DEPARTMENT

C. H. PURCELL, Chief of Division of Highways.

PROGRESS REPORT FOR THE MONTH

The following statement indicates the progress of State highway work for the portion of the current month up to January 22d:

Work placed under contract.....	\$947,400
Contracts pending and advertised.....	\$67,500
	\$1,014,900
Work anticipated to be advertised during the coming month.....	\$3,817,400

CONTRACTS COMPLETED, PROJECTS ACCEPTED

During the past month nearly twenty major contracts have been completed and accepted for the Division of Highways. Included in these contracts were the following:

San Diego-El Centro Highway—Just west of Coyote Wells in Imperial County a new steel and concrete subway has been constructed under the tracks of the San Diego and Arizona Railroad on the new alignment of this lateral, made after the cloudburst in 1926, which completely destroyed the old road.

Coast Route—An improvement on the Coast Route is noted by the construction of a new bridge across Nojiqui Creek, in Santa Barbara County. This new structure is built on a new alignment of the highway at this point and replaces the old narrow structure built many years ago by the county on an alignment which was dangerous to present high speed traffic.

Valley Route—The widening and paving of the eight miles between Fowler Switch Canal and Fancher Creek on the Valley Route just south of Fresno has been completed. The improvement cost \$283,200 and was carried through the town of Fowler.

Bayshore Highway—Progress on the Bayshore Highway, in San Mateo County, is seen with the completion of the final stage of construction on the five miles between South San Francisco and Burlingame. A 40-ft. Portland cement concrete pavement was laid on the graded roadbed which was completed about two years ago, extending from the grade separation under the S. P. tracks in South San Francisco to Broadway in Burlingame where it connects with the recently completed pavement between Burlingame and San Mateo. Pavement is now being poured on the portion of the route through South San Francisco. The present project was constructed at a cost of \$436,400.

Tiburon Work—An improvement of interest to motorists of the bay area is the reconstruction of the

State highway from the ferry slip at Tiburon to the Belvedere railroad crossing in Marin County.

McDonald-to-the-Sea Highway—In Mendocino County three short sections of the State highway, which extends from the Redwood Highway at McDonald, just north of Cloverdale, to the coast at Navarro Head, have been graded and surfaced with untreated crushed rock on improved alignment and grades.

Victory Highway—Another unit in the reconstruction of the trans-Sierra highway which leads from Central California to Reno via Auburn and Truckee, is added by the completion of the overhead grade separation at Yuba Pass in Nevada County. The new structure will eliminate the use of the present dangerous grade crossing near Crystal Lake.

Feather River Bridge—A project of widespread interest which has been completed and accepted during the past period, is the 500 foot bridge across the Feather River and the Western Pacific R. R. tracks, about $4\frac{1}{2}$ miles east of Oroville in Butte County. This bridge is a unit in the construction of the new all year Oroville to Quincy lateral which will follow the Feather River Canyon.

Shasta Canyon Bridge—The second of five bridges to be constructed on the new alignment of the Pacific Highway between Yreka and the Klamath River, in Siskiyou County, has been completed at a point $5\frac{1}{2}$ miles north of Yreka. Construction on the remaining three bridges and the grading of the roadway is being pushed forward and all work should be completed on this section by the beginning of summer.

Trinity River Bridge—A large steel bridge has been erected on the Eureka-Redding lateral across the South Fork of the Trinity River about two miles west of Salyer in Humboldt County.

LIST OF HIGHWAY BIDS AND AWARDS

For month of January

IMPERIAL COUNTY—Bet. Trifolium Canal and Kane Springs, grading and surfacing with asphalt concrete 6.3 miles. Dist. VII, Rt. 26, Sec. B., Clark and Henry Const. Co., San Francisco, \$159,523; Steele Finley, Santa Ana, \$143,845; Basich Brothers, Torrance, \$158,285; R. E. Hazard Const. Co., San Diego, \$151,635; Daley Corporation, San Diego, \$181,926; Southern Calif. Road Co., Los Angeles, \$162,613; Contract awarded to Griffith Company, Los Angeles, \$142,323.

LOS ANGELES COUNTY—Widening Topango Creek Bridge, eight 27-foot timber spans and Las Flores Creek bridge, two 26-foot concrete spans and

surfacing approaches. Dist. VII, Rt. 60, Sec. B. & A., Oberg Brothers, Los Angeles, \$33,341; Paul M. White, Santa Monica, \$31,524; Sidney Smith, Los Angeles, \$33,796; Frank A. Weller, San Diego, \$28,916. Contract awarded to Owl Truck Company, Los Angeles, \$27,369.

ARCHITECTURAL AWARDS

For month of January, 1931

AGNEWS STATE HOSPITAL—Physician's Cottage, contract awarded to The Minton Company of Palo Alto for \$7,325. Contract for elevator work awarded to Spencer Elevator Company of San Francisco for \$3,326.

ATTORNEY GENERAL'S OFFICE, State Building, San Francisco—Alterations and additions, awarded to Vogt and Davidson of San Francisco for \$4,480.

CALIFORNIA SCHOOL FOR DEAF, Berkeley—Boys' and Girls' Dormitory Building, and Kitchen and Commissary Building; contract for general work awarded to Monson Bros. of San Francisco, \$172,740. Contract for Heating and Ventilating Work awarded to Geo. A. Schuster of Oakland for \$35,791. Contract for electrical work to George Woolf of Oakland for \$8,192.

VETERANS HOME, Yountville—Installation of water tube boiler awarded to Walter S. Leland of Oakland, \$12,000.

WATER APPLICATIONS AND PERMITS

Applications for permits to appropriate water filed with the Department of Public Works Division of Water Resources during the month of January, 1931.

KERN AND VENTURA COUNTIES—Application 6857. Florence Louise Cuddy, Lebec, Kern County, California, for 100,000 g.p.d. from three unnamed springs tributary to San Joaquin Valley, to be diverted in Sec. 32, T. 9 N., R. 20 W., S. B. E. and M., and Sec. 19, T. 8 N., R. 20 W., S. B. E. and M., for domestic purposes. Estimated cost \$3,000.

MOHOC COUNTY—Application 6858. T. A. Sommi, c/o J. T. Sharp, Attorney, Alturas, California, for 0.02 c.f.s. from an unnamed spring tributary to Pit River, to be diverted in Sec. 9, T. 41 N., R. 9 E., M. D. B. and M., for domestic purposes.

EL DORADO COUNTY—Application 6859. Magnus Jensen, Camino, California, for 0.025 c.f.s. from Fill Canyon tributary to Little Iowa Canyon, Big Iowa Canyon, S. Fork American River, to be diverted in Sec. 33, T. 11 N., R. 12 E., M. D. B. and M., for irrigation and domestic purposes (4 acres). Estimated cost \$200.

INYO COUNTY—Application 6860. W. C. Parcher, Bishop, California, for 2.5 c.f.s. from Green Creek tributary to Bishop Creek and Owen's River, to be diverted in Sec. 2, T. 9 S., R. 31 E., M. D. B. and M., for power purposes, 1.6 h.p. Estimated cost \$250.

INYO COUNTY—Application 6861. W. C. Parcher, Bishop, California, for 0.047 c.f.s. from Green Creek tributary to Bishop Creek and Owen's River, to be diverted in Sec. 2, T. 9 S., R. 31 E., M. D. B. and M., for domestic purposes. Estimated cost \$265.

NEVADA COUNTY—Application 6862. John K. Williams, Nevada City, California, for 2.0 c.f.s. from Windup Canyon tributary to Greenhorn Creek, the ce Bear River, to be diverted in Sec. 5, T. 16 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$150.

LAKE COUNTY—Application 6863. Leavitt Mead McQuestion, c/o Division of Pomology, University Farm, Davis, California, for 0.31 c.f.s. from Clover Creek tributary to Middle Creek, to be diverted in Sec. 6, T. 15 N., R. 9 W., M. D. B. and M., for irrigation purposes on 25 acres. Estimated cost \$250.

SAN DIEGO COUNTY—Application 6864. Coleman M. Gray, c/o George H. Stone, Attorney, San Diego Trust & Savings Bldg., San Diego, California, for 0.06 c.f.s. from Castro Creek tributary to San Luis Rey River, to be diverted in Sec. 18, T. 9 S., R. 1 W., S. B. E. and M., for irrigation purposes on 6 acres. Estimated cost \$1870.

ALAMEDA COUNTY—Application 6865. Sisters of the Sacred Names of Jesus and Mary, a corporation, c/o Rathel, Wood & Kilkenny, Attorneys, Chancery Building, San Francisco, California, for 0.1 c.f.s. from Laurel Spring and Sulphur Spring tributary to Agua Caliente Creek, to be diverted in Sec. 8, T. 5 S., R. 1 E., M. D. B. and M., and Sec. 18, T. 5 S., R. 1 E., M. D. B. and M., for domestic purposes. Estimated cost \$8,000.

ALAMEDA COUNTY—Application 6866. Sisters of the Sacred Names of Jesus and Mary, a corporation, c/o Rathel, Wood & Kilkenny, Attorneys, Chancery Building, San Francisco, California, for 0.2 c.f.s. and 43 ac. ft. per annum, from Laurel Creek and Arroyo Agua Caliente Creek tributary to San Francisco Bay, to be diverted in Sec. 7, T. 5 S., R. 1 E., M. D. B. and M., and Sec. 18, T. 5 S., R. 1 E., M. D. B. and M., for irrigation and domestic (stockwater) purposes on 53 acres and 200 head of livestock. Estimated cost \$525.

RIVERSIDE COUNTY—Application 6867. F. W. Sheffield and Chas. Harnack, c/o R. V. Shedd, Redlands, California, for 3.0 c.f.s. from Falls Creek to be diverted in Sec. 33, T. 3 S., R. 3 E., S. B. B. and M., for irrigation and domestic purposes on 150 acres. Estimated cost \$3200.

INYO COUNTY—Application 6868. Harry J. Halliday, Bishop, California, for 0.0035 c.f.s. or approximately 2260 gallons per day from small unnamed stream tributary to Bishop Creek and Owen's River, to be diverted in Sec. 2, T. 9 S., R. 31 E., M. D. B. and M., for domestic and recreational purposes. Estimated cost \$155.

SISKIYOU COUNTY—Application 6869. Elliott Creek Mines, Inc., c/o W. L. Cobb, Pres., Box 668, Roseburg, Oregon, for 20 c.f.s. from Elliott Creek tributary to Applegate River, to be diverted in Sec. 19, T. 48 N., R. 10 W., M. D. B. and M., for power purposes (181.8 h.p.).

NEVADA COUNTY—Application 6870. Charles Thompson, c/o John F. Hoffman, Agent, Box 307, Grass Valley, California, for 50 c.f.s. from (a) Steep-hollow Creek and (b) South Fork of Little Greenhorn Creek tributary to Bear River, to be diverted in (a) Sec. 32, T. 17 N., R. 11 E., M. D. B. and M., and (b) Sec. 16, T. 16 N., R. 10 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$50.

TRINITY COUNTY—Application 6871. Stanley G. Shepard and associates, Denny, Trinity County, California, for 30 c.f.s. from Slide Creek (and Emigrant Creek at its mouth) tributary to New Creek, to be diverted in Sec. 19, T. 8 N., R. 8 E., H. B. and M., for mining purposes.

PLUMAS COUNTY—Application 6872. Max Paul Boehme, 809 Kearny Street, San Francisco, California, for 1.0 c.f.s. from Mill Creek tributary to East Branch of the N. Fork of Feather River, to be diverted in Sec. 27, T. 25 N., R. 8 E., M. D. B. and M., for irrigation and domestic purposes on six acres.

HUMBOLDT COUNTY—Application 6873. Thomas Nelson McDaniel, 312 Byington Building, Reno, Nevada, for 150 c.f.s. from Willow Creek tributary to Trinity River, to be diverted in Sec. 10, T. N., R. 4 E., H. B. and M., for mining and domestic purposes.

PLUMAS COUNTY—Application 6874. Oscar T. Schumacher, Quincy, California, for 1.0 c.f.s. from unnamed spring tributary to Dixon Creek, thence Nelson Creek, thence Middle Fork Feather River, to be diverted in Sec. 32, T. 23 N., R. 10 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$350.

SAN DIEGO COUNTY—Application 6875. Crowell D. Eddy and Florence I. Eddy, c/o Crowell D. Eddy, 1322 1/2 13th Street, National City, California, for 0.25 c.f.s. from a Spring in unnamed stream tributary to Sweetwater River, to be diverted in Sec. 31, T. 16 S., R. 2 E., S. B. B. and M., for irrigation and domestic purposes on 20 acres. Estimated cost \$500.

EL DORADO COUNTY—Application 6876. Mrs. Bertha Stover, c/o A. E. Carette, 1279 Temple Street, Los Angeles, California, for 1/3 miner's inch c.f.s. from

School House Spring tributary to Mosquito Creek, thence S. Fork American River, to be diverted in Sec. 15, T. 11 N., R. 11 E., M. D. B. and M., for irrigation and domestic purposes on 8 acres. Estimated cost \$75.

SAN JOAQUIN COUNTY—Application 6877. J. L. Blossom and F. M. Lamb, c/o Ohm & Rabb, 109 E. Weber Avenue, Stockton, California, for 15.15 c.f.s. from North Canal tributary to Middle River Branch of San Joaquin River, to be diverted in Sec. 35, T. 1 N., R. 4 E., M. D. B. and M., for irrigation purposes on 121.26 acres. Estimated cost \$14,000.

DEL NORTE COUNTY—Application 6878. Walter G. Muncey, P.O. Box 378, Crescent City, California, for 2000 gallons per day from Kelly's Gulch tributary to Smith River, to be diverted in Sec. 27, T. 17 N., R. 2 E., H. B. and M., for irrigation and domestic purposes on two acres.

MONO COUNTY—Application 6879. Edith Raymer, Bishop, California, for 0.005 c.f.s. or approximately 3250 g.p.d. from Convict Creek tributary to Owen's River, to be diverted in Sec. 14, T. 4 S., R. 28 E., M. D. B. and M., for domestic purposes. Estimated cost \$500.

TULARE COUNTY—Application 6880. J. H. Garner, Box 666, Springville, California, for 1.0 c.f.s. from Bear Creek tributary to Tule River to be diverted in Sec. 3, T. 20 S., R. 30 E., M. D. B. and M., for irrigation and domestic purposes on 34 acres. Estimated cost \$500.

ORANGE COUNTY—Application 6881. Mrs. C. C. Cravath, Box 43, Laguna Beach, California, for 360 gallons per day from spring tributary to North Fork San Juan Creek, to be diverted in Sec. 33, T. 6 S., R. 6 W., S. B. B. and M., for domestic purposes.

LOS ANGELES COUNTY—Application 6882. Clarence A. and Wm. Harvey Cruzan, c/o Clarence A. Cruzan, 915 E. 105th Street, Los Angeles, California, for 2.0 c.f.s. (1.0 c.f.s. from each of two springs) from (1) Warm Spring and (2) Whiskey Spring tributary to Mint Canyon, thence Santa Clara River, to be diverted in (1) Sec. 4, T. 5 N., R. 14 W., S. B. B. and M., and (2) Sec. 17, T. 5 N., R. 14 W., S. B. B. and M., for mining purposes. Estimated cost \$5000.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during January, 1931.

YUBA COUNTY—Permit 3643, Application 6412. Issued to Maurice E. Lawton, Strawberry Valley, Calif., January 12, 1931, for 0.05 cubic foot per second from Stickner Spring in Section 20, T. 20 N., R. 8 E., M. D. M., for power purposes. Estimated cost \$600.

INYO COUNTY—Permit 3644, Application 2787. Issued to The Southern Sierras Power Company, Riverside, California, January 13, 1931, for 2999 acre feet per annum from Middle and North Forks Bishop Creek in Sections 8 and 6, T. 9 S., R. 31 E., and Sections 35 and 25, T. 8 S., R. 30 E., M. D. B. and M., for power purposes. Estimated cost \$60,000.

INYO COUNTY—Permit 3645, Application 4549. Issued to The Southern Sierras Power Company, Riverside, Calif., January 13, 1931, for 2000 acre feet per annum from Green Lake Creek in Section 11, T. 9 S., R. 31 E., M. D. M., for power purposes. Estimated cost \$10,000.

INYO COUNTY—Permit 3646, Application 2788. Issued to Nevada-California Power Company, Riverside, Calif., January 13, 1931, for 2999 acre feet per annum from Middle and North Forks of Bishop Creek in Sections 8 and 6, T. 9 S., R. 31 E., M. D. M., for power purposes. Estimated cost \$60,000.

MENDOCINO COUNTY—Permit 3647, Application 6805. Issued to L. A. Howie, Redwood Valley, Calif., January 27, 1931, for 0.16 cubic foot per second from Redwood Valley Creek in Section 32, T. 17 N., R. 12 W., M. D. M., for irrigation and domestic purposes on 12.9 acres. Estimated cost \$500.

MONTEREY COUNTY—Permit 3648, Application 6725. Issued to Samuel R. and C. C. Avila, King City, Calif., January 14, 1931, for 0.19 cubic foot per second from Carrizo Spring in Section 29, T. 21 S., R. 5 E., M. D. M., for irrigation and domestic purposes on 15 acres. Estimated cost \$2500.

MENDOCINO COUNTY—Permit 3649, Application 6805. Issued to L. A. Howie, Redwood Valley, January 27, 1931, for 0.16 cubic foot per second from Redwood Valley Creek in Section 32, T. 17 N., R. 12 W., M. D. M., for irrigation and domestic purposes on 12.9 acres. Estimated cost \$500.

MARIPOSA COUNTY—Permit 3650, Application 6762. Issued to John J. Fiske, Coulterville, Calif.,

January 27, 1931, for 0.011 cubic foot per second from an unnamed spring in Section 26, T. 2 S., R. 17 E., M. D. M., for irrigation and domestic purposes on 4 acres. Estimated cost \$100.

VENTURA COUNTY—Permit 3651, Application 6589. Issued to Julius Olender, Fresno, Calif., January 31, 1931, for 0.039 cubic foot per second from unnamed spring, in Section 25, T. 7 N., R. 19 W., S. B. B. and M., for mining purposes. Estimated cost \$100.

SAN JOAQUIN, STANISLAUS AND CALAVERAS COUNTIES—Permit 3652, Application 6522. Issued to Linden Irrigation District, Stockton, Calif., January 31, 1931, for 40,000 acre feet per annum and 154 cubic feet per second from Calaveras River in Section 5, T. 2 N., R. 9 E., M. D. M., for irrigation and domestic purposes on 12,330 acres. Estimated cost \$105,000.

DAM APPLICATIONS

AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1931.

LASSEN COUNTY—Avilla Dam No. 253. Antone Avilla, Red Bluff, owner; lumber and rock, 93 feet above streambed with a storage capacity of 440 acre feet, situated on Pit River tributary to Sacramento River in Sec. 1, T. 37 N., R. 7 E., M. D. B. and M., for diversion purposes for irrigation use.

MODOC COUNTY—Willow Creek Flat Dam No. 121-4. Bixby Hoffman Cattle Co., Ltd., Alturas, owner; earth fill, 10 feet above streambed, situated on Willow Creek tributary to Clear Lake in Sec. 11, T. 46 N., R. 11 E., M. D. B. and M., for storage purposes for irrigation use.

MODOC COUNTY—Lookout Dam No. 164. Lookout Dam Company, Lookout, owner; 10 feet above streambed with a storage capacity of 200 acre feet, situated on Pit River tributary to Sacramento River, for diversion purposes for irrigation and stock use.

LASSEN COUNTY—Thompson Dam No. 257. S. J. Thompson, Bieber, owner, earth and timber dam, 8 feet above streambed with a storage capacity of 45 acre feet, situated on Pit River tributary to Sacramento River in Sec. 11, T. 37 N., R. 7 E., M. D. B. and M., for diversion purposes for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1931.

MODOC COUNTY—Rye Grass Swale Dam No. 150. W. B. Graves, Alturas, owner; earth, 30 feet above streambed with a storage capacity of 2000 acre feet situated on Rye Grass Swale tributary to Pit River in Sec. 25, T. 41 N., R. 11 E., M. D. B. and M., for storage purposes for irrigation use. Estimated cost \$1750, fee paid \$20.

RIVERSIDE COUNTY—Bailiff Dam No. 824. R. E. Bailiff, Cabazon, owner; rock fill, 28 feet above streambed with a storage capacity of 5 acre feet, situated on a creek tributary to Whitewater River in Sec. 18, T. 3 S., R. 2 E., S. B. M., for storage purposes for domestic and irrigation use. Estimated cost \$4500. Fee paid \$20.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of January, 1931.

MODOC COUNTY—Rye Grass Swale Dam No. 150. W. B. Graves, Alturas, owner; earth dam, situated on Rye Grass Swale tributary to Pit River in Sec. 25, T. 41 N., R. 11 E., M. D. B. and M.

MONTEREY COUNTY—Black Rock Dam No. 643. Monterey Stock and Game Association, Monterey, owner; earth dam, situated on Black Rock Creek tributary to Carmel River in Sec. 32, T. 17 S., R. 2 E., M. D. B. and M.

LOS ANGELES COUNTY—Lower Franklin Dam No. 6-14. City of Los Angeles, Los Angeles, owner; earth, located in Sec. 12, T. 1 S., R. 15 W., S. B. M.

LOS ANGELES COUNTY—Porter Estate Dam No. 775. B. F. Porter Estate, San Francisco, owner; earth dam located in Sec. 9, T. 2 N., R. 16 W., S. B. M.

MODOC COUNTY—Toreson Dam No. 153. F. W. Caldwell and Mrs. J. V. Caldwell, Canby, owners; earth dam, situated on Tom's Creek tributary to Pit River in Sec. 16, T. 41 N., R. 10 E., M. D. B. and M.

NEVADA AND PLACER COUNTIES—Bear River Dam No. 97-11. Pacific Gas & Electric Co., San Francisco, owner; gravity, situated on Bear River tributary to Yuba River in Sec. 22, T. 15 N., R. 9 E., M. D. B. and M.

MONO COUNTY—Upper Twin Lake Dam No. 531. G. B. Day Estate and Plymouth Land and Livestock Company, Wellington, Nevada, owners; rockfill, situated on Robinson Creek tributary to East Walker River in Sec. 5, T. 3 N., R. 24 E., M. D. B. and M.

MONO COUNTY—Lower Twin Lake Dam No. 531-2. Hunevill Land and Livestock Company; Day Estate and F. W. Simpson, Wellington, Nevada, owners; rockfill, situated on Robinson Creek tributary to East Walker River in Sec. 33, T. 4 N., R. 24 E., M. D. B. and M.

MONO COUNTY—Dexter Creek Dam No. 532. Wm. Symons, Laws, California owner; earthfill situated on Dexter Creek.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of January, 1931.

ORANGE COUNTY—Santiago Creek Dam No. 75. Serrano and Carpenter Irrigation Districts and The Irvine Company, Orange, owners; earth, 110 feet above streambed with a storage capacity of 25,000 acre feet, situated on Santiago Creek tributary to Santa Ana River in N. W. corner Blk. 70, Rancho Lomas de Santiago, for storage purposes for irrigation use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of January, 1931.

MODOC COUNTY—Webb Flat Dam No. 160. Gerig Bros. et al, Bieber, owners; earth, situated on Webb Flat tributary to Egg Lake in Sec. 5, T. 41 N., R. 7 E., M. D. B. and M.

CONTRA COSTA COUNTY—Antioch Dam No. 3. Town of Antioch, Antioch, owner; earth, situated on unnamed creek tributary to San Joaquin River in Sec. 36, T. 2 N., R. 1 E., M. D. B. and M.

NEVADA COUNTY—Culbertson Dam No. 97-17. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Lower Feeley Dam No. 97-35. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Fall Creek tributary to South Yuba in Sec. 29, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Middle Lindsay Dam No. 97-41. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Upper Feeley Dam No. 97-45. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Fall Creek tributary to South Yuba River in Sec. 28, T. 18 N., R. 12 E., M. D. B. and M.

DEER ARE CAUSE OF WRECK IN HIGHWAY

(From the Roseville Press)

J. A. Lundey of Y street, Sacramento, saved the lives of three deer on the state highway near Weimar Sunday afternoon, but caused a traffic tieup, bruised heads, broken bumpers and bent fenders. Lundey stopped suddenly on the highway when traveling about 35 miles per hour. The cars following him from the snowline did not have an opportunity to stop in time.

The three deer crossed the highway and climbed the bank, disappearing in the darkness.

HIGHWAY BEAUTIFICATION AIMS ARE ANNOUNCED

The committee on beautification of highways, San Joaquin Valley Tourist and Travel Association, at the annual meeting of the association held during January in Bakersfield reported the following recommendations, which were unanimously adopted:

Elimination of objectionable road signs on scenic highways.

Due to the fact that exotic plants are not permitted introduction into the national parks, the beautification of these areas must be along the line of protection of natural growth and in cleaning up debris in those areas.

That shade trees be planted along all state highways in the Valley to provide shade and beauty.

Conservation of wild flowers by discouraging the picking of all varieties along the roadsides, through education and legislation.

REPORT OF DIVISION OF MOTOR VEHICLES AS OF FEBRUARY 1, 1931

FRANK SNOOK, Chief

PATROL MAY UTILIZE RADIO

For the past two months, quite an extensive research study has been made with a view of establishing the radio as a means of communication for the California Highway Patrol. A transmitting set was established at Mather Field, Sacramento, through which it was capable of contacting men in the patrol as far south as El Centro, to whom orders were given. The station was simultaneously heard in the northern part of the State, New York City, and other distant points. It was conclusively demonstrated by these tests that it is quite feasible to send short wave signals by radio to all parts of the State from a single station. I believe this means of communicating with the men, when perfected, will prove very beneficial and much cheaper for the State than other methods that have been proposed. Today approximately forty-two cities in the United States have radio employed in police service.

(For 1930 motor vehicle registration figures, see page 22 of this issue.)

HIGHWAY WORKER IS HIT BY AVALANCHE

The following news article is from the *San Bernardino Sun*:

A. J. Taylor, employee of the State Highway Department, who was injured in a landslide near Strawberry flats, was reported slightly improved at the Ramona hospital last night.

Taylor suffered several broken ribs, injuries to his right arm and cuts and bruises about the body when a landslide caused a rope to break which he had tied around his body while working on the side of the mountain highway, causing him to drop into a canyon below.

Dr. Ross C. Martin, his attending physician, said last night that Mr. Taylor appeared slightly improved although his injuries are serious.

"I am sorry," said the dentist, "but you can not have an appointment with me this afternoon. I have eighteen cavities to fill." And he picked up his golf-bag and went out.—*Juggler*.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

EARL LEE KELLY, Chairman, Redding
HARRY A. HOPKINS, Taft

TIMOTHY A. REARDON, San Francisco

PHILIP A. STANTON, Anaheim

FRANK A. TETLEY, Riverside

C. H. PURCELL, State Highway Engineer, Sacramento

GEORGE C. MANSFIELD, Secretary

HUGH K. McKEVITT, Attorney, San Francisco

HEADQUARTERS STAFF, SACRAMENTO

G. T. McCOY, Administrative Assistant

L. V. CAMPBELL, Office Engineer

T. E. STANTON, Materials and Research Engineer

FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Chief Accountant

DISTRICT ENGINEERS

F. W. HASELWOOD, District I, Eureka

H. S. COMLY, District II, Redding

CHARLES H. WHITMORE, District III, Sacramento

J. H. SKEGGS, District IV, San Francisco

L. H. GIBSON, District V, San Luis Obispo

E. E. WALLACE, District VI, Fresno

S. V. CORTELYOU, District VII, Los Angeles

E. Q. SULLIVAN, District VIII, San Bernardino

F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division

J. J. HALEY, Jr., Administrative Assistant

HAROLD CONKLING, Deputy in Charge Water Rights

A. D. EDMONSTON, Deputy in Charge Water
Resources Investigation

R. L. JONES, Deputy in Charge Flood Control and
Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams

SPENCER BURROUGHS, Attorney

EVERETT N. BRYAN, Hydraulic Engineer, Water
Rights

A. N. BURCH, Irrigation Investigations

H. M. STAFFORD, Sacramento-San Joaquin Water
Supervisor

GORDON ZANDER, Adjudication, Water Distribution

KATHERINE A. FEENY, Chief Clerk

MABEL PERRYMAN, Secretary

S. T. HARDING, Irrigation and Special Investigations

DIVISION OF ARCHITECTURE

GEO. B. McDOUGALL, Chief, Division of Architecture

P. T. POAGE, Assistant Architect

W. K. DANIELS, Deputy Chief of Division

HEADQUARTERS

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STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



California Highways and Public Works



*New State Building
Los Angeles*

Official Journal of the Department of Public Works
State of California

MARCH

1931

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What Are Our State Highways Worth?

By EARL LEE KELLY, Chairman of the California Highway Commission

PROBABLY no governmental undertaking in California has contributed so directly to the development of California as has the State highway system.

It is a significant fact that the period of California's greatest growth parallels the period of its State highway building.

Thus the three bond issues totaling \$73,000,000 for the creation and construction of a State highways system were approved by the voters of California in the 1910-1920 decade. During this decade California experienced phenomenal population increase, the census for this decade showing a population growth for the State of 44.1 per cent over the preceding decade.

In the 1920-1930 decade, State highways were financed through unspent bond funds and gasoline taxes. The increase in the population of the State during this period was 65.7 per cent.

There were of course other factors entering into this great population growth. Well at the head of the list, however, stands the State highway system.

The contribution of the State highways to California growth and prosperity may be briefly summarized as follows:

1. The expenditures have been spread over the entire State, resulting in a balanced development of rural and urban areas.

2. The highways have facilitated as easy and economic movements of produce from farm to market, and of manufactured goods from maker to consumer.

3. The highways have encouraged a free flow of tourist travel into every part of the State. They have made recreation one of the principal and most profitable industries of the State, and have resulted in bringing untold millions of dollars of "outside" money annually into California.

4. The State highway system has effected directly the living and spending habits of every individual in California.

5. The State highways have "desectionalized" California, and thus to a very large extent eliminated the lost motion and the lost values that inevitably accompany sectional strife and jealousy.

Not only has industry of every kind felt the stimulating influence of State highway con-



EARL LEE KELLY.

struction, but the social life of the State has also reflected this same influence.

I believe that some idea of the value that the people of California place upon their State highway systems can be gleaned if we would consider for a moment their sale value.

Their cost to date to the State has been \$238,815,782.

If we can invade the field of the impossible, and imagine that a monetary offer be made for California's State highways, with the condition attached that once sold, these roads should neither be duplicated nor be open to the use of the public, how much would we take for them?

I can not conceive of an offer large enough to even tempt consideration for a moment.

The reason is that California and its State highways are now one, inseparable both in the thought and in the lives of its people. Without its State highways, California would not be California.

State Water Plan Recommendations Are Given Governor and Legislature

STATE ENGINEER EDWARD HYATT on March 4th transmitted to Governor Rolph and the Legislature the report of the State Water Plan.

The report recommends as an initial construction project to meet present needs.



EDWARD HYATT.

quinn Valley.

A reservoir on the San Joaquin River at Friant, north of Fresno, with a canal leading northward therefrom into Madera County and another southward to the Kern River, with an additional unit south of Bakersfield.

The Colorado River aqueduct and the Santa Ana flood control and conservation project. The capital cost of the plan is approximately \$374,000,000. The salt water barrier is not recommended.

The report is entitled "Bulletin 25, Report to the Legislature of 1931 on State Water Plans," and presents the conclusions of eleven other bulletins which deal with different phases of the Water plans in great detail. It covers the entire subject of the water resources of California, and is a report result-

Kennett reservoir on the Sacramento River near Redding.

An industrial and agricultural canal leading from the neighborhood of Antioch to Martinez.

A system of dams and pumping plants to transport surplus waters from the Sacramento River watershed into the San Joa-

ing from ten years of investigation of the State's water resources and problems of development. It gives the engineering, economic and legal phases of the developments recommended, but does not pass on methods of financing nor organization required to bring them into being. However, it does recommend a constitutional amendment relative to revision of eminent domain procedure, with respect to water rights and rights of way, to facilitate adjustment of water rights and rights of way necessary to execution of the proposed construction program.

WATER NEEDS OF STATE

The report analyzes the water supply and water needs in all parts of the State, and recommends major units of an ultimate State plan for complete conservation of its water supplies, and also an initial or immediate plan to relieve existing shortages.

DEFICIENT WATER AREAS

The investigation has disclosed that there are three large and important areas of the State which are deficient in supply for their present needs. These are: the Sacramento-San Joaquin Delta and Upper San Francisco Bay region, the upper San Joaquin Valley, and the coastal counties of Southern California.

In the delta and bays the invasion of saline water is a problem needing immediate attention, while in the upper San Joaquin Valley there is a shortage of water on 400,000 acres, which if not relieved will result in abandonment of lands and in damage to the whole area.

In Southern California, and particularly in the Santa Ana Basin there is a serious overdraft on underground waters and along the coast this condition is resulting in the intrusion of saline water from the ocean, and there is the further problem of flood waste which if checked would give relief to that area.

The report states that in these three main sections of the State the need for an augmented water supply is vital and for their immediate relief recommends the \$374,000,000 construction program, including the Kennett

that investigations have either not been made in these sections or have not proceeded to the point where a plan could be designed. The three sections for which the plan would provide relief are the largest, most important and in the greatest need.

SACRAMENTO VALLEY WATER

The feasibility of transporting Sacramento River water into the San Joaquin Valley in the future is demonstrated conclusively in the report, which reveals that there is a large usable surplus of water in the Sacramento watershed, over and above the ultimate future needs of that area, even in the driest years.

SALT WATER BARRIER

In disapproving the salt water barrier as a unit for the program, the report states that the fresh water releases from Kennett reservoir, when constructed would control salinity in the delta, would provide irrigation water for that region, and also would meet the industrial needs of the territory adjacent to Suisun Bay, all at a cost less than half that required for equivalent service with a barrier.

COST OF VARIOUS PLAN UNITS

The plan as recommended by the State Engineer in the Sacramento and San Joaquin Valleys and upper San Francisco Bay area as an initial development would cost approximately \$158,900,000, of which \$19,000,000 need not be expended in immediate construction, but which should be included in the financing as an insurance feature. These deferred items are a channel across the delta to provide for carrying the Sacramento River water into the neighborhood of Stockton and dams and pumps to transport this water to the San Joaquin Valley.

COLORADO RIVER AQUEDUCT

The cost of the Colorado River aqueduct is given as \$198,600,000, and that of the Santa Ana River flood control and conservation project as \$16,200,000.

DETAIL OF COST ESTIMATES

The itemized cost estimate of the plan is as follows:

Great Central Valley:

Kennett reservoir -----	\$84,000,000
Sacramento - San Joaquin Delta cross channel (construction deferred)	4,000,000
San Joaquin pumping system (construction deferred) -----	15,000,000
Friant reservoir -----	15,500,000

Upper San Joaquin Valley conduits -----	29,900,000
Contra Costa County conduit -----	2,500,000
Rights of way, water rights and general expense -----	8,000,000

Sub-total Sacramento-San Joaquin Valley -----	\$158,900,000
--	---------------

Southern California:

Colorado River Aqueduct -----	\$198,600,000
Santa Ana River flood control and conservation works -----	16,200,000
Total Southern California -----	214,800,000

Total for State -----	\$373,700,000
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SUMMARY OF CONCLUSIONS

The report of the State Engineer is summarized in the following conclusions:

1. A large surplus of water exists in the Sacramento River Basin over and above the ultimate needs of a total net irrigable area of 3,784,000 acres in the basin if the run-off were properly controlled and regulated. By the utilization of the physical works proposed herein for the Sacramento River Basin, including the Trinity River diversion, regulated supplies without deficiency in amount in any year and dependable in time could be made available in the principal streams to irrigate all of the net irrigable lands, 2,640,000 acres, in the Sacramento Valley, after allowing a gross diversion of 3,241,000 acre-feet with a net use of 1,945,000 acre-feet per year for the irrigation of a net area of 1,234,000 acres of foothill and mountain land in the Sacramento River Basin and further provide a flow into the Sacramento-San Joaquin Delta of 10,292,000 acre-feet per year on the average during the period of subnormal run-off, 1918-1928. Even in the driest year of record, 1924, there would have been 5,759,000 acre-feet of flow into the delta. After providing 1,200,000 acre-feet for the needs of the entire delta and 2,390,000 acre-feet for salinity control, there would still have been a 2,169,000 acre-feet in the driest year. (The Trinity Diversion proposes transportation of Trinity River water through a tunnel into the Sacramento River to augment the regulated flow of the Sacramento River from Kennett Reservoir under the ultimate plan for full conservation and development of the water supply of the Sacramento River Basin. However, it is not a unit in the initial development program.)

2. The invasion of saline water in the upper San Francisco Bay and Sacramento, San Joaquin Delta could be effectively and positively controlled to the lower end of the delta by fresh water releases from mountain storage reservoirs.

3. A salt water barrier located at any of the three typical sites investigated, below the confluence of the Sacramento and San Joaquin rivers would not be necessary or economically justified as a unit of the State Water Plan.

4. The industrial, municipal and agricultural developments of the upper San Francisco Bay region could be adequately and dependably supplied with their fresh water requirements from the fresh water controlled channels of the Sacramento-San Joaquin Delta at a cost of less than half that required for equivalent service with a barrier. The proposed

(Continued on page 26)

State Edifices in South Dedicated; Governor James Rolph is Chief Speaker

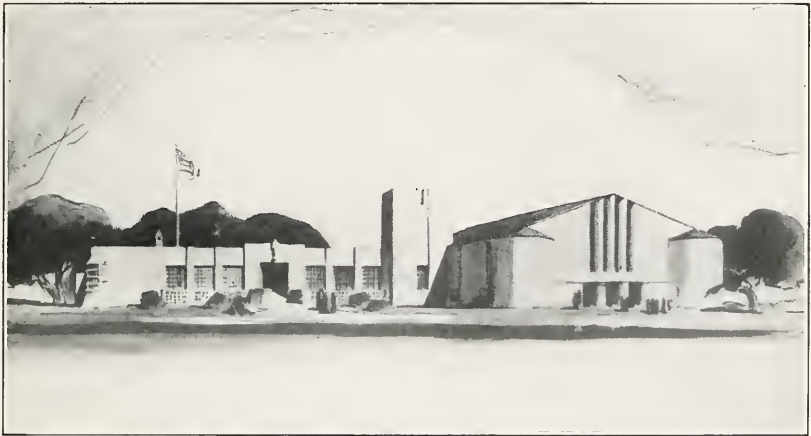
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WHILE some 2000 persons stood with heads uncovered Governor Rolph on Thursday, March 5th, sealed in its place the great granite corner-stone of the new State Building, now under construction in the Civic Center of Los Angeles. With a silver trowel he spread cement over the seams of the ponderous block, locking securely beneath it a copper box containing miscellaneous documents that will give to future generations a picture of Los Angeles as it is today.

gotten; days of depression will have passed and we will have ushered in a new day.

"Times are getting better daily—there is evidence on every hand. The railroads are carrying more freight and the steamships more cargo than they were thirty days ago. Yesterday Uncle Sam opened bids for construction of Boulder Dam—and the diversion of the Colorado River will bring new and greater prosperity to California by quenching the thirst of those arid lands and paving the way for vast industrial enterprises.

"And now, as I help to put this stone in place, I ask the blessing of God on the great State of California."



The New Armory at Long Beach

Encouragement for the immediate future was the keynote of Governor Rolph's address. In fact, during the course of it, he alluded to the stone as "the cornerstone of better times."

"We have witnessed in our lifetime many corner-stone layings such as this," he said, "but how often have we thought of the significance attaching to the laying of the corner-stone of this great universe by the Maker? And what lesson have we derived therefrom?"

"This is indeed a happy occasion, for it witnesseth another milestone in the completion of this mighty edifice of the people. * * * And may I tell you that the people of California have set aside \$5,200,000 for other State buildings, nine of which are to be erected in your midst. And with the commencement of work I am confident dull times will have been for-

In the copper container that now lies under the corner-stone are copies of the plans of the building, photographs of the architect's drawing, portraits of Governor Rolph, Lieutenant Governor Merriam, Director of Public Works Garrison and Mayor Porter; pictures of the State Capitol at Sacramento; copies of the State budget and Governor Rolph's inaugural address; yesterday's editions of all Los Angeles newspapers, copies of the Native Sons of the Golden West Magazine, the Grizzly Bear, and of the Women's Christian Temperance Union organ, the Signal, and thirteen telephone directories containing the names of all subscribers in Los Angeles County.



Governor Ralph Speaking at the Dedication of the Long Beach Armory; Seated to the right of Governor Ralph is Lieutenant Governor Merriam; others on the speaking stand (reading from left to right) are Col. Charles S. Lincoln, U. S. A.; Bragadier General Seth E. Howard, Adjutant General, N. G. C.; John Chamness, President, Long Beach Chamber of Commerce; Lieut. Col. Cross, U. S. A.

The inset is a view of the gubernatorial salute, fired in Governor Ralph's Honor, when he arrived in Long Beach.

The actual cornerstone laying was conducted under auspices of the Grand Parlor of the Native Sons of the Golden West.

The formal ritual read by the Native Sons brought out the fact that the sand, cement and water used in the process had been obtained from widely separated sections of the State, thus constituting "the very essence of her being."

John C. Austin, architect of the new building, presided on the speakers' platform, on which were seated State, county and city officials and a number of prominent laymen. After an invocation by Bishop Cantwell, brief addresses were given by Mayor Porter, Councilman President Sanborn, Henry W. Wright, chairman of the Board of Supervisors; J. A. H. Kerr, president of the Chamber of Commerce; Mrs. Lillie Dyer, founder of the Native Daughters of the Golden West; Chief Justice of the Supreme Court Waste and Associate Justice Seawell.

LONG BEACH ARMORY DEDICATED

On Saturday, February 21, 1931, at Long Beach two elaborate functions marked the dedication of the National Guard armory building recently completed in that city by the Division of Architecture.

The first of the two functions was a luncheon that was given in honor of Governor Ralph and Adjutant General Howard at the Pacific Ocean Club. The second was the formal dedication ceremonies.

The arrival of Governor Ralph at Long Beach was announced by a salute of seventeen guns.

The guests besides the Governor and the Adjutant General, included numerous high ranking officers of the Regular Army and of the National Guard. The large dining room of the club was filled to capacity with prominent citizens of Long Beach. Lieutenant Governor Merriam presided as toastmaster.

Owing to the shortness of time the speak-

(Continued on page 28.)

Highway Patrol Squads to Compete in Lowering California Motor Death Rate

HOPEFUL of making material reductions in the toll of deaths and accidents on the highways of California, the new management of the California Highway Patrol has hit upon an unique system for measuring the efficiency of the various county squads operating as units of the patrol.

Under the new plan each squad will be charged with the responsibility of keeping the death rate down in its respective territory and formal citations will be issued to each squad able to show a reduction in deaths at the end of each year over the previous year.

The squads showing a reduction at the end of each year will be placed upon an honor roll in the order of the amount of such reduction when related to other factors.

In determining the order in which the honor roll squads will appear consideration is given to the number of officers in the squad, the county area, the road mileage, population, and motor vehicle registration.

The efficiency of the men will thus be rated upon the decreases in the death rate shown rather than upon the number of arrests for motor vehicle violations.

The new management of the patrol hopes to stimulate a spirit of competition in this manner among the squads for high places on the roll.

The squad making the best record each year will be awarded place No. 1 on the roll and will be given a loving cup donated by the safety conference of the California State Chamber of Commerce.

This trophy will be presented the winning squad with appropriate ceremonies by Governor James Rolph, Jr., each year. It will become the permanent property of the squad winning it three times.

The initial awards for reductions in deaths in 1930 under 1929 put eighteen squads on the honor roll.

The Riverside County squad with a decrease in deaths of 33 per cent takes place No. 1 on the roll. The loving cup has been presented to Captain J. R. King and his squad and will remain in the custody of this squad unless won by some other squad next year.

The other seventeen squads appear on the honor roll in the following order:

MOTOR SQUAD HONOR ROLL				
Award Number	County Squad	Squad Captain	—Deaths—	
			1929	1930 Reduction
1	Riverside	J. R. King	39	26 13
2	Ventura	S. M. Flynn	33	22 11
3	San Joaquin	L. S. Davis	55	45 10
4	Fresno	W. L. McCarty	51	41 10
5	Kern	L. F. Gaylen	69	59 10
6	Merced	W. A. Burch	27	19 8
7	Del Norte	Edgar Huffman	8	2 6
8	Butte	G. C. Mitchell	11	7 4
9	Imperial	A. F. Oswalt	29	25 4
10	Colusa	D. Ins. R. L. Shelden	10	7 3
11	San Benito	Chesley Joyce	6	4 2
12	Lassen	A. W. Lamme	4	2 2
13	Sutter	G. W. Brown	3	1 2
14	Glenn	E. Breuss	2	0 2
15	El Dorado	E. A. Brewster	8	6 2
16	Solano	Frank Silva	20	18 2
17	Sierra	Insp. A. J. Ponta	2	1 1
18	Kings	A. J. Overstreet	15	14 1

Ventura, San Joaquin, Fresno, Kern, Merced, Del Norte, Butte, Imperial, Colusa, San Benito, Lassen, Sutter, Glenn, El Dorado, Solano, Sierra and Kings.

Ventura County had the same amount of decreases as San Joaquin but took second place because consideration was given to the greater percentage of decrease,

the smaller size of its squad, heavier traffic and other factors. Fresno and Kern counties showed equal reductions in deaths but the percentage of reduction being greater in the case of Fresno coupled with the fact that it has fewer patrolmen per mile of its highways gave that county its position above Kern on the roll.

It is significant to note that marked increases in deaths occurred in such counties as Trinity, Plumas, Nevada and Inyo, where, due to a shortage of men, little or no patroling was possible during the year.

Neatly arranged citation certificates displaying the great seal of California and showing the position of each squad on the honor roll have been presented to each of the squads on the roll.

E. Raymond Cato, superintendent of the patrol and sponsor of the new plan has this to say for it:

"We hope by this system to put the men on their

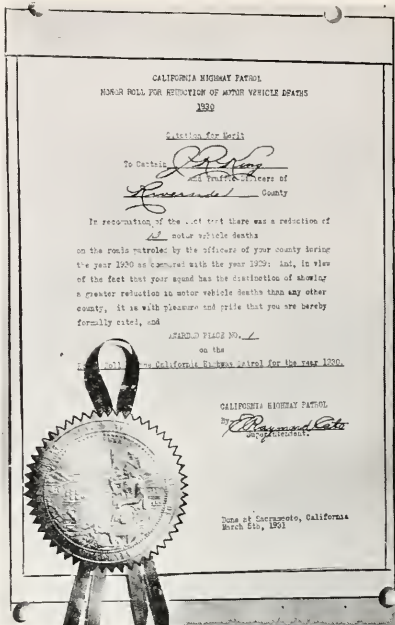
mettle, to create among them a sense of responsibility for the lives of the persons using the highways they patrol.

"It is a basic principle that the real purpose of all motor law enforcement is the protection of life and property. Using this as a conclusion, it follows that the real measure of the officer's efficiency is not the number of arrests he makes but the number of lives he is able to save.

"By stimulating a spirit of competition among the squads for high places on the honor roll it is our hope that the men may be induced to study traffic conditions in their respective districts and to take steps to eliminate traffic hazards thereby reducing accidents."

The citation system put into effect will be augmented by an improved system of record-keeping in the headquarters of the patrol at Sacramento. In this system will be kept the record of every person convicted of a major violation of the Motor Vehicle Act in the State and of every driver involved in a major accident.

It will thus be possible for the patrol to check against the habitual violator. When the same person is found to be involved in two or more accidents within a short period of time, the patrol will make an investigation to determine if the circumstances were merely coincidental or due to some basic fault of the driver. The same system will be employed in checking the records of persons convicted of two or more major violations within a short period.



A Citation for Merit.



The Riverside County Squad of the California Highway Patrol: Standing (left to right), Capt. J. R. King; Officers J. O. Linthicum, D. J. Jessup, C. W. West, Charles Gandy, George Baker, George Atkins, R. E. Dillon; second row, A. R. Hastings, E. F. Nelligan, S. R. Tyson, T. F. Wilson, G. R. Redwine, Gene Henderson, O. E. Townsend.

Closing the East-of-the-Sierras Gap

By F. G. SOMNER, District Engineer, District Nine

ON FEBRUARY 22d "Closing the Gap" in the State highway improvements, Mojave to Sherwin Hill in Mono County, distance 200 miles, was celebrated.

The celebration was held under the auspices of the High Sierras Recreational Association and took place in Red Rock Canyon in eastern

Kern County, 24 miles north of Mojave, a fitting place for the scene of this celebration and an appropriate section chosen to mark the completion in the last link in this thoroughfare. The

completion on January 31, 1931, of the George Herz contract from Cinco to seven miles north of Ricardo,

ers addressed the gathering, extending the felicitations of Governor Rolph and the California Highway Commission upon the happy occasion that the day celebrated.

Above the canyon portions of Red Rock the creekbed widens, with consequent decrease of both velocity and depth of the flood waters, admitting of the crossing and recrossing of the waters in order to secure proper alignment. The crossings are accomplished by means of concrete paved dips. As a substitute for expensive bridges this type of construction was deemed advisable by reason of the freakish character of the cloudburst floods, including indeterminable flow, together with impending treacherous channel changes.

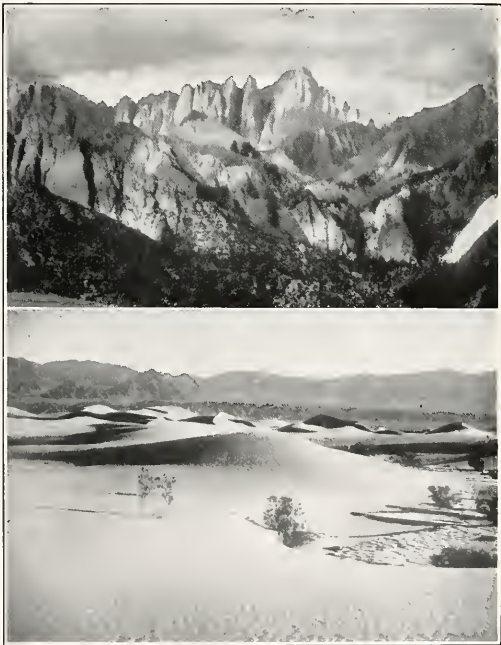
Red Rock is presided over by Rudolph



F. G. SOMNER.

length 15 miles, sets at rest forever the terrors of Red Rock Canyon, the greatest barrier to travel within District IX, owing to the old road having occupied the floor of the canyon, subjecting travelers to the dangers of being caught in roaring currents from periodical cloudbursts originating within a vast drainage area at the head of the canyon. The new highway, 36 feet wide, is constructed on excellent alignment, well above the flood waters of the creek. Portions of embankments exposed to the flood have been protected by rock slope pavement well anchored below the creek bed.

State Highway Commissioner Harry A. Hopkins of Taft was the official representative of Governor Rolph at the celebration. Earl Lee Kelly, chairman of the Commission, was also present. Both commission-



The highest and the lowest points in the United States: The upper view shows the summit of Mt. Whitney, elevation 14,496 feet; the lower view is in Death Valley, 310 feet below the sea level; both are served by the highway, of which this article tells.

Hagen, who has lived there some thirty years and who jealously guards from vandalism the fantasies of nature's handiwork engraved on the canyon's walls, intermingled with glistening and varying colors. The canyon is extremely popular as a week-end sojourn, the visitors gazing in awe at these tremendous formations. Much has been written of its scenic specialties, such as the White Chapel,

State Highway Department. Such conjectures were set aside by State Highway Engineer Purell, who gave the assurance that the Organ Rock would not be disturbed by the highway construction. This monument of nature's handiwork stands intact but the injured little "Lady at the Organ" sits in mute appeal to the passersby for restoration of her former self.



View at the Dedication Ceremonies in Red Rock Canyon.

Sand Temple, Capitol Rock, Liberty Dome, Royal Gateway, etc. The Iron Canyon, a tributary from the west, affords equal attractions, a result of the most peculiar freaks of nature's erosions.

The outstanding scenic feature is the Organ Rock, with the "Lady at the Organ," now a pathetic figure, having been disfigured by vandals. Organizations interested in the preservation of nature's handiwork, and feeling that the erection of the State Highway in such close proximity to the Organ Rock would result in its destruction, made protests to the

THE LAST LINK

Route 23 of the California State Highway extends from Saugus, in Los Angeles County, to Markleville, county seat of Alpine County.

The "Closing the Gap" relates to the last link in the completion of a hard surfaced road constructed to modern standards on Route 23, from Mojave, distance 200 miles, to the Sherwin Hill summit in Mono County, entrance to the extensive recreational area, and far beyond.

When the first California State Highway fund of \$18,000,000 was created, effective

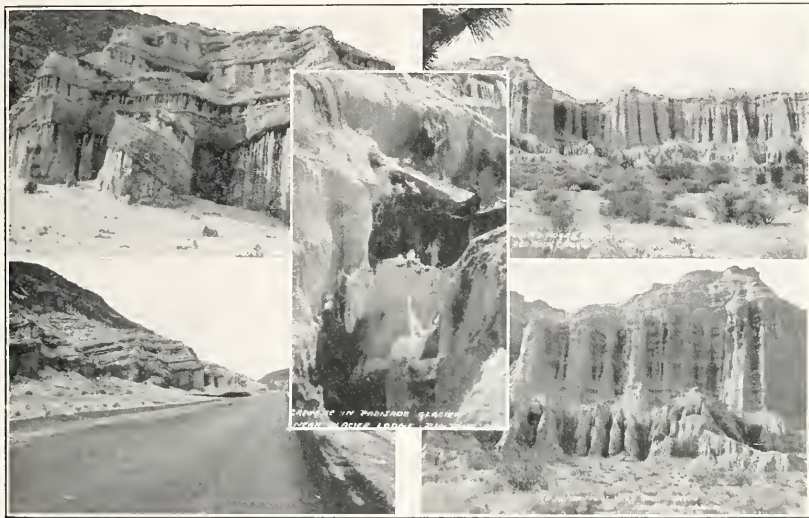
January 1, 1912, there were many demands for the limited allocation of funds to District Six, which covered an extensive mileage. Sand, interminable sand, was the problem east of the High Sierras, accompanied by narrow roadway, crooked alignment and poor drainage. It was imperative that the limited funds be devoted to removal of actual barriers to travel, and very little could be done in the way of permanent improvement. An eight-mile stretch of oiled macadam, together with eight miles of concrete pavement eight feet in width, comprised the hard surfaced roads at the creation of District Nine in October, 1923.

Very little relief was afforded by subsequent bond issues or the Two-Cent Gas Tax

an oiled rock surface. Between Sherwin Hill and George's Creek, ten miles north of Independence, distance 73 miles, the road mix method was employed, the work having been accomplished by day labor. From George's Creek north to Mojave, distance 124 miles, the plant mix method prevailed, and the work all done by contract, divided into eleven jobs, with strict adherence to the precepts of the Research and Material Departments insisted upon.

The roads were built at a reasonable expense. The result is a road reputed to be as fast as any in California.

The trip from Bishop to Los Angeles is no longer a task but a pleasure, and to be added



More views along the highway in Red Rock Canyon: At the upper left are the Pillars of Hercules; upper right, the White House Cliffs; lower left, The Organ Rock; lower right, the Worshippers; inset, Crevice in the Palisade Glacier, the farthest southwest glacier in the United States.

Measure enacted in 1923. The "two ruts in the sand," as the conditions then existing may best be described, received little attention prior to the One-Cent Gas Tax Measure in 1927. Meantime every effort was made to facilitate travel over the whole of the district, and despite the lack of funds a noticeable transition from very bad to easy travel conditions was effected.

"CALIFORNIA MIX" PAVEMENT

The type of pavement employed in the improvements is the well-known California Mix, consisting of a crushed rock base with

is the decreased cost of operating motor busses and freight lines, with corresponding reduction in tariffs.

"SOMETHING OF EVERYTHING"

"Something of everything" is nature's dispensation to the travellers along the State Highway from Mojave to the summit of Sherwin Hill, distance 200 miles. Across the Mojave Desert and through Red Rock Canyon, described in the first chapter of this narrative, and on to Indian Wells Valley. Try the bass fishing, quail and duck hunting at Little Lake, then through Rose Valley past

Cowan Station and Olancha. Look to the left when you reach Lone Pine, at snow capped Cathedral Peaks of the High Sierras, including towering Mount Whitney, the highest mountain in the United States, elevation 14,496 feet; continuing on alongside the Los Angeles city aqueduct and through Owens Valley, cultivated landscapes of hills and valleys, peaceful towns, including Independence, the county seat of Inyo County, and Big Pine.



State Highway Commissioner Harry A. Hopkins, who officially represented Governor Rolph at the Red Rock dedication.

Just to the west lies the Palisades Glaciers, notable as the most southerly glaciers of the United States. You have passed the Panamint Range on the right, bordering on Death Valley, lowest point in the United States, elevation—310 feet, wonderland of thrilling adventure, with all the attributes that make up desert appeal. Still along the base of the High Sierras and passing through Bishop, the metropolis of Inyo County; on twenty miles further, ascending the summit of Sherwin Hill, the gateway to the vast amphitheatre of recreational area, a wonderland of unsurpassed granduer, known until a few years ago only to disciples of Isaac Walton and nimrods. Look in all directions, snow-capped Cathedral

COMMISSIONER REARDON TAKES PUBLIC WORKS REARDON TO TASK OVER FENCE

(From the Oakland Tribune)

Timothy A. Reardon, State Highway Commissioner and President of the San Francisco Board of Public Works, today is conflicting with himself over the repair of a worn out fence on Twin Peaks Boulevard.

According to the story, Reardon, as Highway Commissioner, inspected the worn out fence and decided that himself as President of the Board of Works should do something about it.

As President of the Board of Public Works, he told himself that he was too busy to attend to the job.

"I almost came to blows with myself," he said, "but anyway, the fence will be built. I've promised that to the State Highway Commissioner."

Peaks of the High Sierras, over the summit the famous Minarets overlooking the Thousand Islands at the head waters of the San Joaquin River, home of the golden trout. Also the Mammoth Lakes and thousands of other lakes and streams. This virgin country which man has done nothing to wreck, free from litter and stench, goes on and on as far as eye can see. Those "weary of the roar of the great cities, the fretful stir, unprofitable, and fever of the world" may spend a lifetime of vacation periods reveling each year in new scenes amidst the quiet of mountains, lakes and streams, and their slogan will ever be "See the High Sierras first."

So much for the recreational value of this improvement to the traveling public and commercial interests of Inyo and Mono counties. The closing of the gap is a not unworthy chapter in the epics of the accomplishments of the State Highway organization. Route 23 through eastern Kern County, Inyo and Mono counties furnishes the following interstate connections: From Big Pine to Goldfield, Nevada, via Oasis; from Bishop north to a connection with the Nevada Highway over the Montgomery Pass and on to the east and to the boundary between Mono County, California, and Nevada at the north limits of District 1X. A connection extends from the Mono Basin over the Tioga Pass to the San Joaquin Valley, and also from a connection with the Sonora Road, 18 miles north of Bridgeport.

OF MILITARY IMPORTANCE

The relations between Route 23 and the munitions plant under construction at Haw-

(Continued on page 18.)

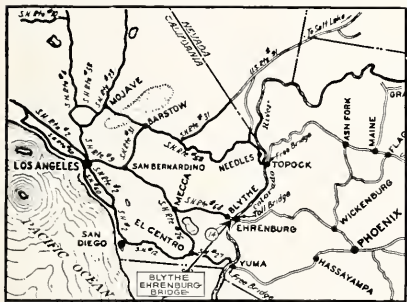
Will Buy Interstate Highway Toll Bridge

ANNOUNCEMENT that an agreement had been reached between California and Arizona and the owners of the Ehrenberg toll bridge over the Colorado River near Blythe in Riverside County for the joint purchase of this structure by the two states, was made on Saturday, March 7th, by Governor James Rolph, Jr.

Negotiations between the bridge owners and representatives of California and Arizona have been in progress in Sacramento for several days. California was represented in these negotiations by Colonel Walter E. Garrison, director of the Department of Public Works, and State Highway Engineer C. H. Purcell. Arizona was represented by State Highway Engineer W. W. Lane. These negotiations were instituted upon instructions from Governor Rolph, following a conference that Governor Rolph held with Governor Hunt of Arizona, and are a phase of the announced policy of Governor Rolph to foster



View of Ehrenburg Bridge.



Map showing location of Ehrenburg Bridge.

and promote a closer friendship with and cooperation between California, Arizona and other neighboring states.

The acquisition of this bridge by California and Arizona will eliminate the present unhappy situation of travelers into California coming from the east via Phoenix being compelled to pay a toll upon their first entrance into California. State highway officials here stated that under the agreement the bridge would be a free structure by September 1st.

Both California and Arizona contemplate spending large sums of money out of their present budgets on roads leading to this

bridge. The expenditures proposed by Arizona were from Federal funds. Objection was made by the Federal government to the fact that the highway upon which the expenditures were to be made lead to a privately owned toll bridge. Under the agreement completed today these objections will be withdrawn and Arizona permitted to undertake the proposed improvements. These improvements consist in general of a relocation of a large part of the highway from Phoenix to the Colorado River. This work will transform the present desert road into a high speed, well aligned highway. California is relocating its highway leading to this bridge in many places and converting it into a fine, modern road.

Governor Rolph and the people of California are rejoiced at the renewal of friendship between Governor Hunt and the people of Arizona.

WEBSTER IS WRONG AGAIN

Draftsman: A man who puts his ideas on paper for the boss to change.

Checker: A man with a blue pencil but no conscience.

Tracer: A slave, who, knowing himself, never understands what the draftsman thinks he knows.

Last but not least.

Engineer: A mechanical (?) genius who spends his time thinking up ideas which he refuses to recognize when he meets them on a drawing.—*Professional Engineer.*

Text of Report of Governor Rolph's State Water Conservation Committee

THE following is the text of the report made to Governor Rolph by his Water Conservation Committee upon its return on February 23d from Washington, D. C., where it conferred with President Hoover and members of Congress relative to the California State Water Plan. Attached to the report is also the text of the Committee's address to President Hoover.

The complete text of these reports is found herein:

REPORT TO GOVERNOR ROLPH

Sacramento, February 24, 1931.

HONORABLE JAMES ROLPH, JR.,

Governor of the State of California,
State Capitol,
Sacramento, California.

MY DEAR GOVERNOR:

The committee appointed by you to proceed to Washington, D. C., to confer with officials of the United States on the California State Water Plan, begs leave to submit the following report:

Membership of Committee.

The personnel of the committee was:

Colonel Walter E. Garrison, Director of Public Works, Chairman.

Edward Hyatt, State Engineer.

Major A. M. Barton, Chief Engineer, State Reclamation Board.

W. B. Mathews, General Counsel, Metropolitan Water District.

State Senator B. S. Crittenden, Chairman Legislative Water Committee.

State Assemblyman Robert P. Easley, Member State Legislative Water Committee.

W. M. Wiley, Secretary Kern County Water Commission.

Objectives.

The first recommendation of the California Joint Federal-State Water Resources Commission, whose report was presented in January, was that "a Commission authorized to represent the State be appointed to go to Washington and endeavor to come to a definite understanding with the executive department of the Federal Government" on these matters.

While the main objectives of your committee were well expressed in this report, the committee also had in mind the arranging, if possible, for an inspection on the ground of the California water project by subcommittees or members of Congress next summer, and for the transmittal to Congress and making public by the Army Engineers the report of the War Department on this project. Minor objectives were conferences with many Federal departments relative to cooperation with the State in various matters not directly con-

nected with the water plan, if time permitted.

Appointments with the President, the Secretary of the Interior, members of Congress and others were made before leaving California.

Conference with President Hoover.

The committee arrived in Washington February 16th, and met with President Hoover that morning. We were very cordially received by the President and pre-

sented to him your message of greeting. After an opening statement, a brief written resume of the mission of the committee and of the California Water Plan was presented. This statement covers the entire subject and a copy is attached to this report as Exhibit A.

Conferences With Other Federal Officials.

During the next two days your committee

RECOMMENDATIONS

The following recommendations were made to Governor Rolph upon the return of his Water Conservation Committee from Washington, D. C.:

1. Immediate action by the California Legislature as recommended in the Federal-State report, in putting before the people of California the three constitutional amendments necessary for the execution of the plan. Detail of those amendments are given on page fifteen of the Federal-State report.
2. The informing of Congress of the water problems of California and the proposed plan by Congressional inspection trips, by furnishing to it data and information, and in all other ways possible.
3. Close and continuous contact with all Federal agencies interested.

called upon Dr. Ray Lyman Wilbur, Secretary of Interior; Dr. Elwood Mead, Commissioner of Reclamation; General George B. Pillsbury, Assistant Chief of Engineers, War Department; the Board of Engineers of the War Department, consisting of seven members; and officials and engineers of these and other executive departments.

Your committee also discussed the California Water Plan with Senators Johnson and Shortridge. A meeting was arranged with the California house delegation, which was attended by all California members except Congressman Clarence Lea, who was sick, at which meeting the whole plan was explained with the aid of a relief map sent to Washington for this purpose.

Your committee also called on Congressman Murphy, of Ohio, chairman of the Interior Department Subcommittee on Appropriations, relative to having his committee inspect the California water project next summer.

Final Conference President Hoover.

Before leaving Washington another meeting with the President was arranged, attended by Director of Public Works Garrison and State Engineer Hyatt, at which the progress made was explained to him. As before we were most graciously received.

Accomplishments.

The pressing water needs of California and the project to relieve present shortages with Federal-State cooperation as recommended in the joint Federal-State report were competently presented to both executive and legislative branches of the United States Government. In the executive departments a clear understanding of our water problems was found and effective cooperation received. Our congressional representatives, while helpful in every way possible, seemed unadvised of the plan and took the view that California must press the plan locally and enact the necessary constitutional amendments before definite action could be had from the United States.

Senators Johnson and Shortridge assured us that they would jointly request the Senate to appoint a Senate committee to inspect the area involved during the coming summer and report its findings to the next Congress, provided, that the report of the Army Engineers of the War Department is presented to Congress during the present session. The War Department has assured us that its report will be given to Congress before its adjournment, March 4th.

The California House Delegation passed a

resolution requesting all Congressmen visiting California during next summer, to avail themselves of the opportunity of investigating the California Water Conservation Plan. Congressman Murphy assured us that he and his subcommittee would visit California during the summer of 1931 and would devote at least four days to the inspection of this project. Dr. Wilbur, Secretary of the Interior, stated that he would accompany this committee during a part of that time. Dr. Elwood Mead, Commissioner of Reclamation, also signified his intention of accompanying this committee during its inspection of the project.

It is desired particularly to point out the importance of the report of the War Department and the progress made in expediting its transmittal to Congress. As soon as this report reaches Congress it is not only publicly available, but is officially before the Congress for action. Due to the telegrams sent by yourself, the assistance of our Senators and Congressman, and by the appearance of this committee before the Assistant Chief Engineer and the Board of Engineers, we believe that this report will reach Congress and the California Legislature promptly and afford material basis for action by the Legislature during its second session.

Conclusions.

Your committee believes that the recommendations of the Federal-State Commission have been carried out as far as possible at this time. With the information and assurances received by your committee from the executive and legislative departments of the United States the way is open for the State of California, through its Legislature, to proceed further by preparing and submitting to the vote of the people of the State the constitutional amendments necessary before the State can act.

In arranging for inspection of the project by congressional committees and members and by expediting the War Department report, much has been accomplished. The executive departments are well informed and are sympathetic to Federal cooperation on the California Water Plan. Congress, on the other hand, is not informed and much educational work will be necessary. Close and continuous cooperation between the State and Federal departments, both executive and legislative, will be necessary to put the plan into execution.

Recommendations.

1. Immediate action by the California Legislature as recommended in the Federal-State report, in putting before the people of

California the three constitutional amendments necessary for the execution of the plan. Detail of these amendments are given on page 15 of the Federal-State report.

2. The informing of Congress of the water problems of California and the proposed plan by Congressional inspection trips, by furnishing to it data and information, and in all other ways possible.

3. Close and continuous contact with all Federal agencies interested.

Other Accomplishments of Trip.

While in Washington it was possible to take up with various Federal departments many other matters of interest to California, particularly those affecting the Department of Public Works and the Reclamation Board. Conferences were held with officials of the Federal Power Commission; U. S. Geological Survey, both water resources and topographic branches; National Forest Service; Department of Agriculture; and War Department.

Arrangements were made whereby a \$5,000 additional Federal allowance will be made available during the present year for stream gaging in California, and a commitment secured for an allowance of \$100,000 for topographic mapping in California during the next biennium, contingent on being matched by the State, as compared to \$35,000 formerly obtained. Other important decisions, impossible of determination by correspondence were also arrived at. In view of the multiplicity of cooperative interests of the State and the United States along those lines, and the availability of Federal assistance, it is also recommended that much closer contact between State and Federal departments on these matter be maintained in the future than has been had in the past.

Accompanying this report are three exhibits as follows:

Exhibit A—Statement to President Hoover, February 16, 1931.

Exhibit B—Report of California Joint Federal-State Water Resources Commission.

Exhibit C—Small Map of California Water Plan as recommended by the State Engineer.

Respectfully submitted,

WALTER E. GARRISON,
Director of Public Works,
Chairman of Committee.

ADDRESS TO PRESIDENT HOOVER

The text of the committee's address to President Hoover, follows:

Willard Hotel, Suite 836,

Washington, D. C., February 16, 1931.

To the President of the United States.

Subject: *California Water Resources Commission.*
Members of the Commission:

Col. Walter E. Garrison, Director of Public Works, Chairman.

Edward Hyatt, State Engineer.

Maj. A. M. Barton, Chief Engineer, State Reclamation Board.

W. B. Mathews, General Counsel, Metropolitan Water District.

State Senator B. S. Crittenden, Chairman Legislative Water Committee.

State Assemblyman R. P. Easley, Member Legislative Water Committee.

W. M. Wiley, Secretary Kern County Water Commission.

MR. PRESIDENT:

This Commission is here to ask your advice and help concerning a program of California water development, and as to how the United States can be interested in this subject which we think is of National importance.

Mr. President, I know that there are few, if any, men who personally know more about the California water situation than yourself, and, therefore, the engineering presentation need take but little of your time. We have heard and read your past public expressions regarding such great water storage projects as are proposed in California.

The California Water Plan has passed the visionary stage and is now definitely up for decision and a very potent factor in such progress has been your own interest and help in initiating the California Joint Federal-State Water Resources Commission and appointing thereon able and qualified representatives of the Federal departments concerned.

This Commission's report was made to you and to the Governor of California early in January and the first recommendation of the report was as follows:

First, that a Commission authorized to represent the State be appointed to go to Washington and endeavor to come to a definite understanding with the executive department of the Federal government as to the terms upon which it will recommend to Congress that Federal aid be extended, and also endeavor to arrange for the introduction in Congress of bills in conformity with such understanding. The importance of this can not be over-emphasized. There is reason to believe that there is in process of formulation a new policy with respect to the Federal relationship to the states as to water development. A Federal Commission is now studying this very question. Here there is a project most carefully investigated both by State and Federal agencies which should go ahead and to which any new policy to be adopted may well be related.

I may say, Mr. President, that Governor Rolph is keenly aware of the importance of water problems in California and in his inaugural address in January said that he stood ready as Governor to do everything in his power toward finding a practical solution of these pressing problems. Therefore, Mr. President, this delegation representing the whole State of California is here at the direction of Governor Rolph to follow up the report of the Federal-State Commission and to attempt to obtain information which will permit the California Legislature, which will meet again this month, to take the necessary forward steps.

As you well know, Mr. President, the main water problem in California is water shortage, shortage during summer and fall in many places and all year in others. The second problem is flood control. There is enough water to fill all requirements and what is needed and what must be had is regulation and distribution. The character of water problems differs somewhat in different sections, but all parts of the State have such problems.

The California Water Plan as recommended by the Federal-State Commission is essentially a relief project. It does not propose irrigation of new lands with consequent increase of the overproduction situation, but is limited to the relief of developed areas, facing retrogression or abandonment, unless help can be obtained. Relief is possible but only with the assistance of both the State and the United States.

The most pressing urgency in which the aid of the Federal government is believed justified and necessary is that in the Southern San Joaquin Valley. Here the stream flow is small and irrigation from wells

(Continued on page 30.)

Highway Moved to Save Historic Landmark

By L. E. McDUGAL, District Office Engineer

SOME 70 or 80 years ago there was built as a ranch house on the Rancho de Rios near San Miguel in San Luis Obispo County a two-story adobe building which was recently threatened with destruction in the widening of the main Coast Highway. As this was generally a reconstruction project, the survey crew were following the present pavement most of the way and due to the proximity of this adobe, which has stood close to the highway and partly on the right of way

of the building instead of following the present course.

Discussion by local and State-wide organizations when they were fearful of the destruction of this old building brought forth some interesting facts regarding this adobe and its connection with the early history of California.

The date of the building of this former ranch house is variously given as 1835 to 1858, but investigation would seem to discredit the earlier date. At that time a Spaniard, Senor Rios and his American partner, Mr. Reed, were the owners of the rancho south of San Miguel and even laid some claim to the mission with the result that adobe bricks from the ruins of the old mission were used to construct this two-story ranch house with walls twenty-four inches thick.

Some time early in the sixties, this ranch was purchased by George Butchart, a Scotchman, who turned the adobe into a roadside tavern and patriotically named it the "Caledonia Inn." It was made a regular stop for the stages and continued for at least the next twenty years to be a popular hostelry. When the railroad was built to San Miguel, the Caledonia Inn undoubtedly knew its most stirring scenes and events as the heads of some of the bandit gangs at various times made their headquarters here.

The first school in this section was held in one end of the inn, while at the other end was the barroom so essential to roadhouses of those days.

For many years, it was more or less abandoned during which time vandalism of various sorts brought destruction to portions of the old inn, but there still remain some of the handmade doors and easements, hand-hewn beams still support the second floor and roof and the typical balcony on the front is intact. The tile roof was taken down years ago, and now adorns a millionaire's bungalow in Catalina Island—so report has it.

So, though many a modern house or building may fall before the march of progress in the construction of highways throughout the State, every effort is made to preserve for future generations the few remaining landmarks connected with the earlier history of the State.



View of Historic Caledonia Inn.

since the road was paved, it was evident that the widening could not proceed without the destruction of this old building as the railroad adjoined the highway on the opposite side.

It is the policy of the Division of Highways to conserve natural scenery areas and historical landmarks, and as soon as the matter was brought to the attention of the District Office, ways and means of preserving this edifice were studied. It was suggested that a retaining wall might be constructed under the front of the building, or that the building be moved back, but upon investigation of the structure, it seemed doubtful whether either of these methods could be carried out without seriously endangering the old adobe toward which time and the elements had not been too kind. It was finally decided that the only way of being certain of retaining intact this old landmark would be to curve the highway around in back of it which could be done without seriously sacrificing alignment. The future highway will therefore go to the west

Accident Record of Young Drivers Alarmingly High

MORE rigid enforcement of the operator's license law to curb reckless youths operating motor vehicles has been recommended to the courts and the various police departments of the State and the California Highway Patrol by the Bureau of Research, Statistics and Traffic Safety of the Patrol.

This follows a study of accident statistics made by the bureau indicating that youths between the ages of 14 and 19 are involved in twice as many accidents as would be the same number of older drivers.

A study of the records for the first six months of 1930 shows boys of this age group were responsible for more than 1600 accidents involving death or injury to themselves and others.

The bureau believes that if the reckless youth persists in endangering his life and the lives of others there is only one thing to do and that is to cancel his license.

Reports of accidents among this group of drivers show a greater variety of surprising causes than in many of the groups of older drivers.

"The immature youth is inclined to be indiscreet and often does the most irrational and unusual things in his driving," the bureau's report said.

"The courts can aid materially in effecting a correction by promptly revoking or suspending the youthful driver's license in flagrant cases. After the license has been revoked, the courts should demand substantial proof from each driver whose license has been revoked that he has not driven a motor vehicle during the period in which his license was suspended.

"Unless a youth can drive as prudently and as carefully, as an adult, he should not be permitted to drive."

CLOSING THE EAST-OF-THE SIERRAS GAP

(Continued from page 12.)

thorne, Nevada, are set forth in an article by W. G. Scott, a member of the American Society of Military Highways, who played an important part in the promotion of State highways east of the High Sierras. In a comprehensive report on the proposed Military Highway from the munitions plant at Hawthorne to tidewater, he dwells upon its relations to Owens Valley as follows:

"As to the importance to Owens Valley of a highway between the munitions base and

tidewater open all the year, the advantage both to the naval depot and to the valley are so self-evident that little need be said. Allowances must be made for several distinct classes of traffic; that resulting from active operations by Los Angeles at the Mono Basin and other sources of water supply; traffic that will be inevitable between the naval depot and tidewater; commercial traffic by motor truck along the route; the stream of motor buses both ways; stage traffic and the possibilities of an increased traffic; important traffic occasioned by hydroelectric systems. All of these features point to the absolute necessity of a distinct two-way traffic system, which will place the towns of Owens Valley on one of the most important highways of America.

DREAMS OF FUTURE REALIZED

The closing of the gap is the bright spot in the lives of the people of this country. The dreams of many years of a smooth thoroughfare reaching for 200 miles along the base of the High Sierras has been realized, resulting in a tendency of a better understanding of the citizenship with each other, with corresponding closer relationship in both social and business life. There is sure to come a closer bond of understanding and neighborliness between Inyo and Mono counties and the southland.

This sportsman's paradise and remarkable scenic area unsurpassed is an everlasting heritage. The thoroughfare, which increases in popularity from year to year, will play a greater part from now on in the lives and happiness of the citizenship of Inyo and Mono counties.

Thus endeth the story of the "Closing the Gap." Fate will some time decree that the writer shall leave these parts, whether the journey be long or short, but his sojourn can be looked upon with great satisfaction. It has increased his respect and confidence in men, and sad will be the parting from a people virile, of high character and appreciative qualities, whom one learns to be fond of and enjoy.

It lies where Nature spread it,
Bringing gladness to our eyes,
Like a jeweled flame of tapestry
Beneath the azure skies;
The Owens Valley below it,
Where creeks and rivers swirl,
Just the High Sierras stretching
Down the middle of the world.

Revised classic: Hush, little ash dump, don't you cry—you'll be a golf course by and by.—*Virginia Pilot.*

Governor Rolph Tells Legislature Progress of Public Works Program

AT THE reconvening of the Legislature in its second session, Governor Rolph submitted the following report to the State Legislature, showing the progress made in advancing the State highway and State institutional building program:

In accordance with my request to the Department of Public Works, that all public works be speeded up as a measure of affording a larger measure of employment to labor and a larger market to business, very substantial progress has been made in making these policies immediately effective. This is true both in construction and maintenance operations of the Division of Highways, and in the building activities of the Division of Architecture.

Generally speaking, the State highway situation may be summarized as follows: State highway projects financed from the July 1, 1931-June 30, 1933, budget have been advanced as follows:

4 contracts awarded, total-----	\$491,200
3 projects now advertised for bids, total-----	1,011,500
32 projects to be advertised for bids April 1st, total-----	4,976,000

Grand total of advanced highway construction program-----\$6,478,700

In addition to the construction, the specific State highway maintenance program has been advanced as fast as seasonal conditions permit. This specific maintenance program includes such work as spraying roadside vegetation; dust oiling; contract and day labor work for furnishing rock for base reinforcement and oil surfacing.

The cost of this work, which will be well under way by April 1st, will approximate \$577,500.

By May 1st a program of specific shoulder improvement on sections of highway in Imperial and Riverside counties will be started, expenditures upon which will approximate \$256,000.

It should be noted that this specific maintenance program is in addition to routine maintenance work and upkeep upon the State highways, which totals nearly \$300,000 per month.

Special unemployment relief work upon the State highway system is affording employment to 3056 men. Of this number 1200 men are employed in the five unemployment relief labor camps; 175 men are employed on the special relief projects out of Monterey, the men living in Monterey; 1681 men are employed on the special relief maintenance crews. These latter men work on the basis of three days a week.

It is of interest to note that a careful check made on the men employed on the Monterey project showed an average of four dependents to each man employed.

Detailed information as to the construction and specific maintenance program is attached to this report.

The State institutional building program also has been advanced in a most gratifying manner. I feel that the detailed progress reports attached hereto fully justifies the action of the Legislature in acceding to

the request made by me during the first half of the legislative session that the State Institutional Building Bills be passed in emergency preference order.

The following summary gives the status of building construction projects handled since January 5, 1931, by the Division of Architecture, Department of Public Works:

1. Total work put under way in field-----	\$ 973,185
2. Total work pending contracts being executed-----	307,000
3. Total work now being advertised for bids-----	294,000
4. Total work drawings under way-----	2,464,000
5. Total work awaiting securing of sites or information-----	1,124,000
6. Two projects awaiting appointment of architects in private practice-----	50,000

Total value of projects-----\$5,512,185

MECCA-BLYTHE TOLL BRIDGE ACQUISITION

Upon my instructions, the Department of Public Works has thoroughly investigated the stability, the suitability, and the value of the Blythe toll bridge. Engineers of both states and the bridge company participated in this investigation, which has just been completed. A full report of the findings of this investigation will soon be ready for submission.

The importance of this structure as a part of the interstate highway system of California and Arizona was such that I felt it my duty to personally contact the Governor of Arizona and other officials of that state regarding this bridge. I found their attitude in this matter to be extremely cordial and agreeable. The State of Arizona is willing to cooperate with California to the fullest extent. Officials of that state expressed their willingness to participate to the amount of 50 per cent of a fair and just cost; the cost to be determined by joint action of the highway department engineers of the respective states and the bridge company.

The bridge company officials on their part have expressed their willingness to sell the bridge at a fair price. By agreement with Arizona officials, Colonel Garrison, Director of the Department of Public Works, and State Highway Engineer C. H. Purcell, have entered into negotiations with the bridge officials.

In connection with the bridge, it will be necessary to add to the State highway system a piece of now existing county road adjacent to the bridge, and about four miles long.

The reports and proposed methods of purchase will be completed in ample time for the Legislature to take action during the present session.

The acquisition of the bridge by California and Arizona will eliminate the present unhappy situation in which travelers from the East find themselves compelled to pay a toll at their first entrance into California.

In order that a complete picture may be shown, I might further state that this bridge crosses the Colorado River at a point near Blythe. The desirability of making it a free structure to travel can be seen in the fact that it forms a direct interstate connection between Route 64 (Mecca to Blythe State highway) in California and the Wickenburg-Ehrenburg

road in Arizona. It forms an important gateway into California for transcontinental traffic through Phoenix from the East.

The states of California and Arizona contemplate, in their present budgets, to spend large sums of money on the roads leading to this bridge. The state of Arizona proposes to relocate a large part of the present road between Phoenix and the Colorado River. In so doing, it will transform the present desert road into a high speed, well aligned highway. Likewise, California is relocating its Route 64 in many places and transforming this important road into a high speed highway. The budget for the 1931-1933 biennium carries an appropriation of \$300,000 for this road. It is certain this route is destined to become one of the most important and heavily traveled roads leading into southern California and Los Angeles from the East, and that traffic over this route will be increased to many times its present travel.

DETAILED REPORT OF ADVANCED PROJECTS—DIVISION OF HIGHWAYS

Attached is a list of the projects included in the advanced program of the Division of Highways:

CONTRACTS AWARDED.

State Highways

Redwood	-----	148-foot timber bridge across Mark West Creek, Sonoma County; \$22,200.
Carmel-San Simeon	-----	Grading 8.6 miles, Rocky Creek to San Remo Divide, Monterey County; \$160,000.
Valley Route	-----	Concrete paving 7.8 miles, Stockton to Calaveras R. and Harney Lane to Houston School, San Joaquin County; \$284,000.
Redwood	-----	Grading portions, Arnold to Pepperwood School, Mendocino County; \$85,000.
		Total work under contract \$491,200 WORK ADVERTISED.
Bayshore	-----	Concrete bridge across San Francisco Creek, San Mateo County.
Valley Route	-----	Bituminous treated shoulders, 30.3 miles, Grapevine to Bakersfield, Kern County.
Redwood	-----	Grading and surfacing 12.5 miles, Pepperwood School to Little Dann Creek, Mendocino County.
		Total work now advertised ----- \$1,011,500

WORK TO BE ADVERTISED BY APRIL FIRST

Carmel-San Simeon	-----	156-foot concrete arch bridge across Garapata Creek, Monterey County.
San Diego-El Centro	-----	Concrete paving 9.3 miles, La Posta Creek to Tecate Divide, San Diego County.
Coast Route	-----	Grading and concrete pavement, 11.1 miles, 2 miles east of Salinas to north boundary, Monterey County.
Red Bluff-Susanville	-----	Rock surfacing, 7.3 miles, Dales to Paynes Creek, Tehama County.
Saratoga-Blooms Mills	-----	Grading and surfacing 3.5 miles, Waterman Switch to Saratoga Gap, Santa Clara County.
Bayshore	-----	Concrete paving, 3 miles, Burlingame to San Mateo, San Mateo County.
San Diego-El Centro	-----	Grading and paving 0.5 of a mile, east of El Cajon, San Diego County.
Arroyo Seco	-----	Grading 5.1 miles, 4 miles north of La Canada and Colby Canyon, Los Angeles County.
East of Sierras	-----	Grading 14.2 miles, Bridgeport to Sonora Junction, Mono County.
Coast Route	-----	146-foot concrete bridge across Carnadero Creek, Santa Clara County.
Redwood	-----	Bituminous macadam surface 10.1 miles, Loleta to Eureka, Humboldt County.

Nevada City Lateral	-----	Grading 1.4 miles, Wise Power House to Auburn, Placer County.
Coast Route	-----	Asphalt paving 3.7 miles, Wigmore to Los Alamos, Santa Barbara County.
Valley Route	-----	Asphalt pavement 12.1 miles, Goshen to Kingsburg, Tulare County.
Redwood	-----	Grading near County line, Mendocino County.
Pacific Highway (West Side)	-----	Grading and graveling 4 miles, Williams to 4 miles south, Colusa County.
San Marcos-Sequoia Park	-----	Oil rock shoulders, 0.3 of a mile, Plaza Garage to 0.3 of a mile westerly, Tulare County.
Valley Route	-----	Grading 5.2 miles, Canton Creek to Pirn Creek, Los Angeles County.
Coast Route	-----	30-foot asphalt pavement, 3.2 miles, Serra to San Clemente, Orange County.
San Diego-El Centro	-----	Bridge and concrete pavement, approaches, across Boundary Creek, San Diego County.
El Centro-Yuma	-----	Asphalt pavement widening 20.9 miles, Highline Canal to Sand Hills, Imperial County.
Redwood	-----	Bridge across Eel River at Dyer-ville, Humboldt County.
Alturas Lateral	-----	Crushed gravel surfacing 66.1 miles, Fall River to Hat Creek, Shasta and Lassen counties.
Pacific Highway	-----	Bridge across Clear Creek, Shasta County.
Feather River Lateral	-----	Grading 1.2 miles Spanish Creek to Keddie, Plumas County.
Placerville-Tahoe	-----	Paving 0.4 of a mile, Placerville city limits to Clark and Main Streets, El Dorado County.
Placerville-Tahoe	-----	Paving 6.8 miles, Brighton to Mills, Sacramento County.
Pacific (East Side)	-----	Bridge across Coon Creek, Placer County.
Stockton-Santa Cruz	-----	Bridge across Walker Slough, San Joaquin County.
Stockton-Santa Cruz	-----	Bridge across Homestead Canal, San Joaquin County.
Valley Route	-----	Paving 7 miles, Turner Station to Stockton, San Joaquin County.
Placerville-Tahoe	-----	Oil surfacing 1.6 miles, Placerville to railroad crossing, El Dorado County.
		Total to be advertised by April 1st ----- \$4,976,000
		Grand total of contracts awarded, work now being advertised, and work to be advertised by April 1st ----- \$6,478,700

SPECIFIC MAINTENANCE PROJECTS

In addition to the routine maintenance work of upkeep to the State highways which totals nearly \$300,000 each month, the Maintenance Department is making every effort to advance the specific program as fast as the seasonal conditions of the road will permit.

The spraying of roadside vegetation is already under way in some sections and will be well completed during March. This work will cover some 1150 miles and represents an expenditure of \$80,000.

Specifications are being prepared covering the dust oiling work, which is one of the important seasonal programs from a motorist's point of view. This type of work is programmed for 1040 miles of roadway and 330 miles of shoulders at an expenditure in excess of \$300,000. The greater part of this work should be advertised and under way the latter part of April, although road and weather conditions must always be considered in this work.

Preliminary reports are prepared and specifications

under way for contract and day labor work for furnishing rock for base reinforcement and oil surfacing. The base reinforcement, etc., is estimated to cost \$225,000 and the armor coat and oil processing work about \$160,000. Approximately one-half of the rock will be produced under contract, and work will be under way as soon as contracts can be let, which should be by the middle of April. The balance of the rock will be purchased from commercial plants and hauled with rented or State-owned equipment. The oil work will follow the production of the rock, and is planned to start by May 15th. In addition to this work plans are under way for shoulder improvement in Imperial and Riverside counties totaling \$256,000. This work should start about May 1st.

DETAILED REPORT OF ADVANCED PROJECTS—
DIVISION OF ARCHITECTURE

In the preliminary paragraphs of this statement, a summary was given showing a total of \$5,512,185 in State building projects, which have been advanced in accordance with the administration's program. The following pages show the detail upon which the foregoing summary was based:

STATUS OF PROJECTS BEING HANDLED BY THE DIVISION
OF ARCHITECTURE—1929 APPROPRIATIONS

1. Hospital building, Stockton State Hospital-----	\$92,000 00
Industrial building, Stockton State Hospital-----	22,500 00
Work under way in field.	
2. Physical education building, San Diego State Teachers College-----	10,000 00
Work under way in field.	
3. Unit for infirm patients, Patton State Hospital-----	45,000 00
Work under way in field.	
4. Dormitories and kitchen, School for Deaf-----	285,000 00
Work under way in field.	
5. Hospital building, Pacific Colony-----	98,000 00
Administration building, Pacific Colony-----	26,000 00
Industrial building, Pacific Colony-----	10,000 00
Bids received February 17, 1931.	
6. Administration building, California Institution for Women-----	100,000 00
Two ward buildings, California Institution for Women-----	106,000 00
Drawings 90 per cent complete.	
7. Pathological laboratory, Agnews State Hospital-----	80,000 00
Drawings started.	
8. Science building, Santa Barbara State Teachers College-----	110,000 00
Drawings 15 per cent complete.	
9. Warehouse, San Quentin State Prison-----	50,000 00
Work under way in field.	
10. Laundry building, San Quentin State Prison-----	45,000 00
Drawings 70 per cent complete.	
11. Cannery building, Folsom State Prison-----	20,000 00
Drawings completed.	
Work under way in field.	
12. Remodel old administration building, Folsom State Prison-----	20,000 00
Drawings 20 per cent complete.	
13. Ward building, Pacific Colony-----	55,000 00
Drawings 20 per cent complete.	
14. Office building at San Luis Obispo, Division of Highways-----	43,000 00
Drawings 100 per cent complete, but must be revised to reduce the cost of project.	
15. Ward unit, Southern California State Hospital-----	320,000 00
Drawings 100 per cent complete. Must wait for confirmation of site title or selection of new site.	
16. Miscellaneous minor construction work-----	56,185 00
Work under way in field.	

Chapter

19-31	1. Ward unit No. 2, Agnews State Hospital-----	\$320,000 00
	Work under way in field.	
20-31	2. Completion of ward No. 7, Mendocino State Hospital-----	60,000 00
	Contracts awarded.	

Chapter

22-31	3. Night employees' building, Norwalk State Hospital-----	37,000 00
22-31	Day employees' building, Norwalk State Hospital-----	33,000 00
22-31	Physician's residence, Norwalk State Hospital-----	8,000 00
23-31	4. Addition to Infirmity Unit, Patton State Hospital-----	40,000 00
	Drawings completed.	
	Will start construction immediately by day's labor.	
24-31	5. Employees' building, Stockton State Hospital-----	35,000 00
28-31	6. Employees' building and garages, Pacific Colony-----	54,000 00
	Drawings completed.	
	Bids to be received March 3, 1931.	
30-31	7. Cottage for boys, Whittier State School-----	40,000 00
	Drawings completed.	
	Bids to be received February 24, 1931.	
25-31	8. Live stock unit No. 2, Agricultural Park, Sacramento-----	140,000 00
	Drawings completed.	
	Bids to be received March 3, 1931.	
25-31	9. Poultry building, Agricultural Park, Sacramento-----	60,000 00
	Drawings completed.	
	Bids to be advertised February 27, 1931.	
17-31	10. Guards' cottages, Folsom Prison-----	25,000 00
	Drawings completed.	
10-31	11. Completion of gymnasium, San Jose State Teachers College-----	40,000 00
	Drawings 90 per cent complete.	
48-31	12. Club building, San Diego State Teachers College-----	15,000 00
48-31 & Gift Fund	13. Scripps cottage, San Diego State Teachers College-----	11,000 00
9-31	13. Dormitory building, California Polytechnic School-----	40,000 00
	Drawings 50 per cent complete.	
19-31	14. Attendants' building, Agnews State Hospital-----	90,000 00
	Drawings 20 per cent complete.	
49-31	15. Completion of auditorium, Chico State Teachers College-----	30,000 00
	Drawings 20 per cent complete.	
17-31	16. Cell block foundation, Folsom State Prison-----	25,000 00
	Drawings 20 per cent complete.	
28-31	17. Ward building, Pacific Colony-----	46,000 00
	Drawings 20 per cent complete.	
21-31	18. Remodel dining room and kitchen, Napa State Hospital. Remodel amusement hall, Napa State Hospital-----	40,000 00
	Drawings started.	
57-31	19. Completion of San Francisco State Building-----	210,000 00
	Drawings 40 per cent complete.	
6-31	20. Rifle range at Oakland, California National Guard-----	7,500 00
	Work in field to start at once.	
4-31 & 248-31	21. Detention building, California Institution for Women-----	106,000 00
	Drawings started.	

STATUS OF PROJECTS TO BE HANDLED BY ARCHITECTS IN
PRIVATE PRACTICE—1931 APPROPRIATIONS

Chapter

S. B. 100	1. Dairy unit, Preston School of Industry-----	\$40,000 00
	Architect appointed: Russell Guerne de Lappe.	
	Conference held in State Architect's office and at Preston School. Instructions given. Preliminary studies being made. Project involves purchase of land.	
8-31	2. Library building, Fresno State Teachers College-----	125,000 00
	Architects appointed: Swartz & Ryland.	

Chapter

Chapter

Conference held in State Architect's office and at Fresno State Teachers College. Instructions given. Preliminary studies being made. Project involves purchase of land.

12-31 3. Gymnasium units, San Diego State Teachers College. 155,000 00

Architect appointed: William H. Wheeler. Conference held in State Architect's office and at San Diego State Teachers College. Must wait for program of requirements as furnished by Mr. Hill of the Department of Education. Requirements to be available February 25, 1931.

24-31 4. Remodel kitchen building, etc., Stockton State Hospital. 65,000 00

Architect appointed: Peter L. Sala. Conference held in State Architect's office and at Stockton State Hospital. Instructions given. Mr. Sala has submitted written recommendation that appropriation be increased to properly carry out the project.

15-31 5. Training school, Humboldt State Teachers College. 170,000 00

Architect appointed: Franklin T. Georgeson. Conference held in State Architect's office. Must wait for program of requirements as furnished by Mr. Hill of the Department of Education. Requirements to be available February 24, 1931.

10-31 6. Science building, San Jose State Teachers College. 202,000 00

Architect appointed: Ralph Wyckoff. Conference held in State Architect's office. Must wait for program of requirements as furnished by Mr. Hill of the Department of Education. Requirements to be available March 3, 1931.

11-31 7. Primary unit and dining room, California School for Deaf 242,000 00

Architect appointed: Charles F. B. Roeth. Conference held in State Architect's office and at California School for Deaf. Instructions given. Preliminary studies being made.

5-31 8. Hospital unit, Veterans' Home 500,000 00

Architect appointed: Frederick H. Meyer. Conference held in State Architect's office and at the Veterans' Home. Instructions given. Preliminary studies being made.

6-31 9. Armory at Yuba City, California National Guard. 25,000 00

Architect appointed: Charles F. Dean. Conference held in State Architect's office. The project involves the donation of a site to the State. No action can be undertaken with drawings until site is secured. Adjutant General Howard has been so advised.

14-31 10. Library and classrooms, Chico State Teachers College. 117,000 00

Architect appointed: Chester Cole. Conference held in State Architect's office. Must wait for program of requirements as furnished by Mr. Hill of the Department of Education. Requirements to be available February 23, 1931.

7-31 11. Superintendent's cottage and ward buildings, State Nar-

cotic Hospital. 55,000 00

Architect appointed February 12, 1931: Frederick H. Eley. Conference held in State Architect's office and conference being held today at Narcotic Hospital, instructions to be given and preliminary studies will commence immediately.

23-31 12. Dairy unit, Patton State Hos- 25,000 00

pital. Architect appointed February 13, 1931: G. Stanley Wilson. Conference held in State Architect's office and conference being held today at Patton Hospital, instructions to be given and preliminary studies will commence immediately.

22-31 13. Ward building, Norwalk State 75,000 00

Hospital. Architect appointed February 11, 1931: Gilbert Stanley Underwood Co. Conference held in State Architect's office and at Norwalk State Hospital. Instructions given and preliminary studies being made.

28-31 14. Ward building and dairy unit, 60,000 00

Pacific Colony. Architects appointed February 11, 1931: Walker & Eisen. Conference held in office of Walker & Eisen with State Architect. No action on drawings can be undertaken until selection of sites is determined by Department of Institutions.

6-31 15. Armory at Pasadena, California National Guard. 50,000 00

Architects appointed February 11, 1931: Bennett & Haskell. The project involves the donation of a site to the State. No action can be undertaken with drawings until site is secured. Adjutant General Howard has been so advised.

20-31 16. Ward building, Mendocino 90,000 00

State Hospital. Architect selected February 17, 1931: Martin A. Sheldon. Conference held in State Architect's office. Mr. Sheldon to confer with Dr. Crowley, who, we understand, will be appointed the new Medical Superintendent at the Mendocino State Hospital, effective March 1, 1931. Mr. Sheldon expects to confer with Dr. Crowley in San Francisco, if possible, immediately.

13-31 17. Additional classrooms, San 100,000 00

Francisco State Teachers College. Architect appointed February 17, 1931: S. Helman. Conference held in State Architect's office. Must wait for program of requirements as furnished by Mr. Hill of the Department of Education. Requirements to be available February 28, 1931.

16-31 18. Training school, Santa Bar- 70,000 00

bara State Teachers College. Architect appointed February 19, 1931: Wm. A. Edwards. Conference held in State Architect's office. Project involves a layout of roads and walks of campus surrounding building site as decided by Department of Education and Division of Architecture. This will be started immediately.

6-31 19. Armory at Salinas, appoint- 35,000 00

ment not made. Architects appointed: Powers & Ahnden, San Francisco. Appointment made February 20, 1931.

29-31 20. Cottage for boys, Sonoma 75,000 00

State Home. Architects appointed: Powers & Ahnden, San Francisco. Appointment made February 20, 1931.

(Continued on page 25.)

Commission States Policy Relative to Highway Additions

AT THE meeting of the California Highway Commission on February 26th, upon unanimous vote of the members of the Commission, the following statement of policy was issued to the press:

"The California Highway Commission at its meeting on January 29, 1931, passed a resolution by unanimous vote approving and endorsing Senate Bill No. 46 providing for the orderly addition of highways after proper engineering study to the secondary State highway system.

"It is the opinion of the California Highway Commission that additions of highways to the State system in an orderly manner after proper study and consistent with the financial ability of the State to improve and maintain its roads, is imperative if the State highway system is to be adequately developed and protected.

"The California Highway Commission accordingly reaffirms its support of Senate Bill No. 46 and its companion measure in the Assembly, and expresses the hope that these measures will be enacted into law without amendment."

NEWSPAPER COMMENT ON HIGHWAY MATTERS

Plans For Roadside Buildings.

This is from the *Santa Barbara News*:

Free architectural assistance will be given by the county planning commission to property owners who are planning commercial buildings along the State or county highways outside of the incorporated cities of the county, according to L. Deming Tilton, executive officer of the Commission.

Some weeks ago the Commission announced free architectural assistance to ranchers who were planning to build new homes or remodel old ones. The announcement aroused interest among property owners interested in other development in the rural parts of the county and their inquiries led to the offer of assistance in building store structures and other commercial improvements.

It is Tilton's hope that by establishing a high type of rural architecture in the county its development can be influenced and eventually the rural part of the county may become as famous as Santa Barbara city for attractive and harmonious architecture.

"The Rocks" Protected

The following item is from the *Watsonville Register*:

With the view of reassuring residents of this vicinity of the intention of the Highway Commission to preserve the natural beauty of "The Rocks," scenic spot on the Watsonville-San Juan road, in the proposed highway routing through that section, L. H. Gibson of San Luis Obispo, District Engineer of the

HIGHWAY COMMISSIONERS PRESENT GOVERNOR WITH MINIATURE OF CAPITOL

(United Press News Article)

A tiny wooden shack, painted blue and gold and equipped with a miniature dome, is California's State Capitol whenever Governor Rolph goes to his ranch in San Mateo County.

The building was donated to the Governor by members of the State Highway Commission after the Governor had presented the State with a strip of land through his property for the Bayshore highway.

It is now equipped with lights, heat and telephone, and one of the Governor's ranch hands has painted a large sign, reading, "Governor's Office," above the entrance.

State Highway Commission, was in the city yesterday with John T. Porter for a conference with the Pajaro Valley Chamber of Commerce and newspapermen.

According to Gibson, considerable misunderstanding has arisen as to the fate of "The Rocks" in the proposed highway construction, as a result of which F. E. Barney of Gilroy, a "Rocks" property owner, is said to have circulated a petition in Gilroy and vicinity to have the road routed to the north, missing "The Rocks" entirely.

"Regardless of what has been said or done," said Gibson, "our purpose is to put the road through in a manner that will in no way mar the beauty of the spot. The proposed route will follow practically the same course as the existing road, in keeping with the necessity of straightening out curves and filling in. The route we favor follows along the edge of oak groves without destroying them and scratches only one rock on the whole route."

Gibson expressed himself as opposed to the petition advocating a routing north of "The Rocks."

"By following such a course," he said, "The Rocks" would be shut off from view from the road entirely, which we do not believe would coincide with the wishes of the majority of interested parties in this vicinity."

Highway Bottle Breakers Fined.

The *Pacific Palisades* prints the following article:

Throwing glass bottles from a moving automobile upon a public highway endangering the lives and property of other people is an expensive pastime when apprehended.

Dana C. Henry, 1332 Sixth Street, Venice, found that out when he was taken in to Malibu Justice Court on a complaint sworn to by James A. Stauff, in charge of the Maintenance Department of the State Highway. Henry pleaded guilty to the charge, and inasmuch as the bottle contained liquor Judge Webster fined him \$50.

Highway Tree Planting.

The *Indio Date Palm* publishes the following article:

E. W. Campbell, who has been in the service of the State Highway Department during the past two

years, is in charge of the planting of trees in the three counties of San Bernardino, Riverside and Imperial. Of late he has been giving personal attention to the planting of Arizona ash along the highways in the Coachella Valley. The Arizona ash is said to be a very fine tree, and is adapted to this location.

Order Wings Built on L. A. State Building.

State Finance Director Rolland A. Vandegrift announced tonight he has directed John C. Austin, Los Angeles architect, to proceed with plans for wings of the Los Angeles State Building now in process of construction.

This is in line with the Finance Director's belief that a material saving to the State can be effected by building the proposed wings along with the main structure, instead of waiting until a later date, as previously had been planned. He estimated the saving at \$200,000.

To Rebuild Famous Pioneer Highway Sections.

The following article is from the *Placer Gold* at Loomis:

The State Highway Commission is planning to get to work early on all road work as an aid to the unemployment situation, and one of the first pieces of work will be on the course of more than a mile of the historic Auburn Ravine, where gold was first discovered in this county.

It was at the head of Auburn Ravine Forks, just about where the new highway will end, that Claude Chana in May, 1848, found gold in the Auburn district. At that time what is now known as Auburn was called Wood's Dry Diggings.

The finding of gold by Chana started the mining boom that resulted in the founding of the city of Auburn.

Highway Worker Injured.

The *Redding Searchlight* prints the following article, which illustrates the peril of highway building:

A broken right arm and a wrenched back were suffered by Earl E. Miller, powder man for the State Highway Commission, when he slipped on a bluff near Ingot and was struck by a rock as he fell. Miller was employed on construction work near Ingot.

Congress Saves Scenic Spots in Orange County.

Passage of the bill introduced by Congressman Phil D. Swing to reserve for public ownership all rocks, reefs, pinnacles and small islands off the Orange County coast, was announced here today in a telegram from Con-

Maintenance Men Are Commended for Aid in Accident

The following letter received by State Highway Engineer C. H. Purell, from C. G. Bulli of Los Angeles is self explanatory. The letter reads:

I want to take this opportunity as a disinterested bystander of expressing my sincere appreciation of the very fine work done by your foreman, Mr. V. S. Ver Bryck, whom I understand is foreman of a San Bernardino division.

I happened to be instrumental in summoning aid for two boys who skidded on a wet pavement and went over the embankment from Cajon Pass. It just so happened that the house where I called was the residence of Mr. Ver Bryck. He summoned his crew in a most skillful, expeditious manner, got the car up the seventy-five foot embankment to the highway, straightened it out, adjusted the boys' lights, etc., so they could continue on their trip into Los Angeles. This was done to help these two 16-year-old boys and without any pay or reward to Mr. Ver Bryck whatsoever.

I think it is unjust that such a splendid spirit of community helpfulness and such a fine impression of the duties of his office should go unnoticed, even though as I say, the gentleman is an entire stranger to me. It materially increased my already warm admiration for the efficiency and personnel of the State Highway Department.

A MOTORIST'S PRAYER

One enthusiastic motorist apparently believes that safety driving rules are applicable for all of life's conduct, it is indicated in a communication reaching the Automobile Club of Southern California. This motorist suggests that the following prayer be pasted on all windshields where the driver might constantly have it in view:

"O, Lord, teach us to drive through life without skidding into other people's business. Preserve our brake lining, that we may stop before going too far. Help us to hear the knocks in our motors and close our ears to the clashing of other people's gears. Keep alcohol in our radiators and out of our stomachs. Absolve us from the mania of trying to pass the other fellow on a narrow road. Open our eyes to the traffic signs and keep our feet on the brakes. Amen."

The motor vehicle industry of the United States and the various affiliated enterprises employed a total of 4,700,000 persons last year.

gressman Swing to Postmaster T. E. Stephenson, Santa Ana, says the *Anaheim Bulletin*.

The bill passed the Senate with minor amendments, in which the house concurred today, Swing's message said, and the bill now will go to President Hoover for his signature.

The measure was prepared after private parties attempted to assert ownership of certain rocks along the coast at Laguna Beach.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON-----Director
GEORGE C. MANSFIELD-----Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 MARCH, 1931 No. 3

Motor Violators' Record To Be Kept By Highway Patrol

COMPLETE records will be kept hereafter by the California Highway Patrol of all persons convicted in California of major violations of the Motor Vehicle Act.

These records will be kept in alphabetical order thus enabling the patrol to keep a check on the habitual violator by noting each new offense committed.

The records will be taken from abstracts of convictions forwarded to the patrol by court officers as provided under section 156 of the act. Should two or more major violations by the same person be recorded within a short period, the patrol will make an investigation and either warn the offender or cause his license to be canceled.

A similar system of records covering drivers involved in major accidents was inaugurated some time ago and is functioning satisfactorily, it was announced.

Working under the supervision of Superintendent E. Raymond Cato, the Bureau of Statistics is now checking the records of the 119,879 convictions of violations or forfeitures of bail reported during 1930. The officials estimate this is about 80 per cent of the total number of convictions during the year, many Justices and court officers failing to report their abstracts as required by law.

Of the total reported, 49,300 were from Los Angeles County courts, 7835 from Alameda, 6697 from San Diego and 5631 from Riverside.

Court officers were urged to assist in increasing the efficiency of the new records by reporting all convictions as required by the act.

Iowa built 1000 miles of road in 1930.

GOVERNOR ROLPH TELLS LEGISLATURE PROGRESS OF PUBLIC WORKS PROGRAM

(Continued from page 22.)

<i>Chapter</i>	
29-31	21. School and gymnasium, Sonoma State Home..... 40,000 00 Architects appointed: Powers & Ahnden, San Francisco. Appointment made February 20, 1931.
31-31	22. Superintendent's residence, Industrial Home for Adult Blind 15,000 00 Appointment not made. Director of Finance requests no action to be taken until advised.
20-31	23. Laundry building, Mendocino State Hospital..... 60,000 00 Architect appointed: Chas. E. Perry, Vallejo. Appointment made February 20, 1931.

A REAL EXPERT WITNESS

A young foreigner was being tried in court and the questioning by the lawyer on the opposite side began.

"Now, Laszky, what do you do?"

"Ven?" asked Laszky.

"When you work, of course," said the lawyer.

"Y, work—"

"I know," said the lawyer, "but what at?"

"At a bench."

"Oh!" groaned the lawyer. "Where do you work at a bench?"

"In a factory."

"What kind of a factory?"

"Brick."

"You make bricks?"

"No; de factory is made of bricks."

"Now, Laszky, what do you make in that factory?"

"Eight dollars a week."

"No, no! What does the factory make?"

"I dunno; a lot of money, I think."

"Now listen! What kind of goods does the factory produce?"

"Oh," said Laszky, "good goods."

"I know; but what kind of good goods?"

"The best."

"The best of what?"

"The best there is."

"Of what?"

"Of dose goods."

"Your honor," said the lawyer, "I give up!"

CHINA'S HIGHWAY PROBLEM

With more than four hundred million people living in an area somewhat larger than the United States, China has only 35,000 miles of road, with only about 2000 miles paved. In the whole country there is less than 8000 miles of railroad and only 30,000 motor vehicles.

Chinese engineers who attended the recent International Road Congress in Washington presented the situation as a problem of world importance. Handicapped by lack of funds, China faces the necessity of getting food through to starving millions.

Government funds are so limited that the national program as now laid out calls for only 25,000 miles of main roads in a period of twenty years.

The average retail price of passenger automobiles sold in the United States during 1930 was \$800.

STATE WATER PLAN RECOMMENDATIONS ARE GIVEN GOVERNOR AND LEGISLATURE

(Continued from page 4.)

Contra Costa County conduit will adequately and economically serve the present needs.

5. The water supply in the San Joaquin River Basin is insufficient to meet the ultimate water requirements in that basin. Importation from the Sacramento River Basin, the logical source of a supplemental supply, would be required for full development. By the utilization of the physical works proposed herein, including underground storage capacity in the upper San Joaquin Valley, and operated in conjunction with the physical works in the Sacramento River Basin, an adequate and dependable supply could be made available to all the net irrigable lands in the lower San Joaquin Valley, 1,810,000 acres and all the good lands (classes 1 and 2), 3,135,000 acres in the upper San Joaquin Valley, after allowing 688,000 acre-feet annually for the irrigation of 246,000 acres of net irrigable area in the eastern foothills, a total net irrigable area of 5,191,000 acres.

6. There are approximately 402,000 acres of highly developed irrigated land in the upper San Joaquin Valley which are overdrawing the water supply locally available. In order to prevent retrogression in this region, supplemental water must be imported from an outside source. These lands have not the financial capacity to bring in such a supply.

7. The construction of the works proposed herein for the Santa Ana River Basin would save about 90 per cent of the water now wasting into the ocean.

8. The units proposed for initial development in the Great Central Valley could not be financed from revenues which could be obtained from the sale of water and electric energy. Income from other sources must be obtained in order to finance the development.

9. Many interests would be substantially benefited through the consummation of the Great Central Valley and San Francisco Bay project. If these benefits were assessed to those interests benefited, sufficient income might be derived therefrom to carry the additional financial burden not capable of being carried by revenues from the sale of water and electric energy.

10. The flood control and navigation benefits which would result from the operation of the units of the initial development in the Great Central Valley would be so substantial that financial participation may well be expected from the Federal government.

11. The execution of a State water plan under the present status of the law, might be long delayed by injunction suits by many claimants in many courts and might be made utterly burdensome by awards of excessive compensation in condemnation proceedings. A constitutional amendment should be drawn to provide a revised law of eminent domain administered by an agency having State-wide jurisdiction and properly constituted and empowered so that those entitled to compensation could be speedily and fairly provided for without undue difficulty, delay, or expense in the prosecution of the plan.

SUPPORTING BULLETINS

Six of the supporting appendices to the final report also were transmitted with it to the Governor and the Legislature. These were:

Bulletin 28A, "Industrial Survey of Upper San Francisco Bay Area."

Bulletin 31, "Santa Ana River Basin."

Bulletin 32, "South Coastal Basin."

Bulletin 33, "Rainfall Penetration and Consump-

Accidents at Grade Crossings in 1930 Decrease 6 Per Cent

GRADE crossing accidents in California decreased 6 per cent, and the casualties resulting from such accidents were 10 per cent less during 1930, than in 1929, President Clyde L. Seavey of the Railroad Commission has announced.

This record is remarkable, President Seavey points out, in view of the fact that there was an increase of approximately 20 per cent in the number of traffic accidents of all kinds occurring on the highways of the State during 1930.

In pointing out that the number of grade crossing accidents and casualties during 1930 did not keep pace with the sharp increase shown by general highway accidents, President Seavey made the following statement:

"The decrease in grade crossing accidents and casualties during 1930 may be attributed to a number of reasons, such as additional protective devices at grade crossings by order of the Commission, more careful observation by drivers of vehicles of the provisions of section 114 of the Motor Vehicle Act, which requires motorists to stop before crossing railroad tracks when a danger signal is displayed, indicating the immediate approach of a train; or to the general education and special work of various public and civic organizations which are making special drives to reduce all classes of highway accidents. However, the reduction in grade crossing accidents alone is an indication that our work is bearing results."

According to a report filed with the Railroad Commission by Joseph G. Hunter, transportation engineer of the Commission, there were 2755 grade crossing accidents during 1930, resulting in 204 deaths, and the injury of 877 persons. In 1929 the grade crossing accidents numbered 2929, with 213 persons killed and 993 injured. These figures include all grade crossing accidents, whether at public or private crossings, or accidents occurring between crossings.

According to records compiled by the State Division of Motor Vehicles the number of traffic accidents increased from 26,921 in 1929, to 31,019 in 1930. The number of persons killed in motor accidents increased from 2244 in 1929, to 2384 in 1930, while the number of persons injured in highway accidents jumped from 25,443 in 1929, to 41,237 in 1930. The number of vehicles involved in accidents in 1930 showed a new high record of 47,965, as against 40,877 in 1929.

Use of Water in Santa Ana River Valley and Coastal Plain."

Bulletin 34, "Permissible Annual Charges for Irrigation Water in Upper San Joaquin Valley."

Bulletin 36, "Cost of Irrigation Water in California."

Of the seven reports sent to the Governor and the Legislature, four are printed and available to the public at this time. These are numbers 28A, 31, 32 and 34. Bulletin 25 is expected to be received from the printing office in about ten days.

Courtesy of Highway Patrol Wins Praise From Motorists Aided

AUTO SHOW EXHIBIT APPRECIATED

From James A. Myers of Oakland: This is just a note commending the very interesting and excellent exhibit of the State Highway Patrol at the Automobile Show at the Civic Auditorium in San Francisco, under the direction of District Inspector Charles Reade and Captain Arthur O'Connor. I also noted during the time I spent there, the courteous attention given to the public by the several officers in attendance at the exhibit. I trust that next year may give us an opportunity for a similar inspection of State work.

AID GIVEN AUTOIST

From E. L. Jameson, Redding: Jointly with my wife, I wish to extend my kindest thanks to the California Highway Patrol for the courtesies extended to my wife by J. R. Franck, who so kindly brought her home to Redding, sick, when the car she was riding in was broken down and unable to come further.

KINDNESS TO INJURED DOG

From Mrs. D. F. Spangler, Encinitas: We want your Bureau to know that your officers are not only rendering assistance to human beings, but to "our four-footed friends" as well, and we wish to heartily commend the action of Officer H. N. Coates of Oceanside, for the humane service rendered when he found our police dog "Princess Pat" seriously injured, on the highway near Encinitas.

To the passing public, she was "only a dog" and they had neither time nor inclination to render assistance, but to Officer Coates she was "somebody's pet" and suffering, and could not voice her complaint that she had two badly broken legs, to the people who stopped, looked at her and only said "Poor dog." Due to this officer's timely aid, Princess Pat is recuperating in the hospital and joins us in most sincere appreciation of your efficient organization.

COURTEOUS WARNING BRINGS THANKS

From Mark A. Hall, Los Angeles: On January 17th, I was driving with my family south on the highway leading from Santa Ana to Balboa. I failed to notice, until too late, a 15-mile zone sign, and ran past it at a speed in excess of that rate. Presently I was accosted by Traffic Officer Bradford, No. 169, who called my attention to the violation.

Officer Bradford was very courteous, but at the same time showed a commendable zeal in cautioning me against violations of the law. I wish to commend him both for his politeness and his efficiency. If all officers would adopt such an attitude in the performance of their duty, I am sure that motorists as a class would be more cooperative in obeying the law.

AIDED WINTER SPORTS CARNIVAL

From F. E. Wadsworth, Superintendent of Recreation Camps and Playgrounds, Los Angeles County: I want you to know that we, of the Los Angeles Big Pines Recreation Camp, greatly appreciate the fine cooperation your motorcycle officers gave us during the Fifth Annual Winter Sports Carnival, in handling the traffic over the Cajon Pass and Lone Pine Canyon.

We had in excess of 30,000 people during this carnival and as far as we can learn, the traffic was handled without an accident. A great part of this is due to the fine work your men did in patrolling the roads and I want you to thank each and every one of them for me. Assure them that they are always welcome at the Big Pines Camp and we are glad to have them drop in at any time.

From Leonard Taylor, Sacramento: Last Monday, while motoring, I had some trouble with my distributor at Del Paso Park, and discovered a broken part.

At that time a highway patrolman came along and stopped to inquire of my trouble and then very gladly offered to procure one part which was broken at Roseville as he was on his way there, and bring it back with him, which he did for me.

I did not ask his name but got his star number, so I wish to thank Patrolman No. 89 for his very kind attention shown me and to comment on the efficiency of your State highway patrolmen.

From Joseph M. Murphy, Portland: I am writing you in regards to one of your officers, Mr. John S. Shopper. On February 2d, 1931, I was coming from Greenville, California, to Red Bluff, California, and about two miles south of Mineral I met with a little car accident on account of the icy roads, run off the highway and struck a tree.

A car passed me and went on by, and he met Mr. Shopper some few miles down the road. And reported the accident to him. In a few minutes Mr. Shopper drove up in his car and gave me first-aid, as I had quite a severe cut on my right hand. He then took me in his car and drove to Mineral where I had the garageman come and pull my car back on the road, and I got into Red Bluff all right.

I feel that I owe this to Officer Shopper, as he certainly gave me some wonderful help in the predicament I was in. And I would like to have you let him know his help and courtesy, to the extent that his superior officer should know about same.

STATE-WIDE CONTEST FOR BETTER ROADSIDE BUILDINGS SUGGESTED

(From the Santa Barbara News.)

The proposal for a state-wide architectural competition for roadside commercial structures, which was made some time ago by the planning committee of the Community Arts Association, has been received enthusiastically by individuals and organizations in all parts of California, according to Miss Pearl Chase, chairman of the branch.

The Santa Barbara chapter of American Institute of Architects has approved the proposal and an announcement of the competition will be published and distributed up and down the coast.

The state highways throughout California, attracting, as they do, hundreds of thousands of tourists every year and millions of motorists, have developed property fronting on them into valuable commercial sites. The plans committee of the local association appreciates that commercial development of this property will continue to increase as the population of the state grows. It hopes that by this competition prospective builders of roadside establishments will be convinced that an attractive building is a great commercial value and important to the success of any roadside venture.

New York established the first state highway department in 1891.

STATE EDIFICES IN SOUTH DEDICATED: GOVERNOR JAMES ROLPH IS CHIEF SPEAKER

(Continued from page 6.)

ing at the luncheon was confined to the address by the Governor. Governor Rolph captured the gathering with a characteristic address, which combined good humor and optimism with a close analysis of present conditions.

At the close of the Governor's address the assemblage adjourned to the Armory building at California Avenue and Seventh Street for the formal dedication ceremony. An improvised platform was occupied by the Governor and his party, and a large audience occupied chairs arranged in the open court at the rear of the building.

Lieutenant Governor Merriam continued as presiding officer, and at once introduced Governor Rolph who delivered the dedicatory address.

Governor Rolph was followed by General Howard whose address dealt with the National Guard and its various aspects.

Following General Howard several guests including State Architect George B. MacDougall were called on for brief remarks.

Major Harris of the National Guard of Long Beach, who with his coworkers is largely responsible for obtaining the armory, was presented and in turn presented to the assemblage various members of his organization.

Architecturally the Long Beach armory represents a free military design clearly expressive of its purpose. Its large drill hall is emphasized as the important unit of the plan. It is connected to the wing containing clerical and other offices by the interposition of a dignified and vigorous tower.

The building is of reinforced concrete. The exterior of the rough concrete walls has been tooled to produce a very rugged texture and an effect specially appropriate to a building having a military function. The building has a capacity for four companies of the National Guard, the drill hall itself being 71 by 98 feet. There is a basement extending through the entire area of the office wing. The grounds about the building are being landscaped. The cost of the building with its equipment is approximately \$150,000. The fine corner property which constitutes the site was provided free of cost to the State by the city of Long Beach.

This building is the first of a group of comparatively small armory buildings soon to be erected throughout the State. Financial pro-

March 1st Report Shows Snow Light on Mountain Courses

THE March report of the Division of Water Resources' monthly bulletin of snow and precipitation data furnishes the results of snow surveys made in the latter part of February at the "key" snow courses throughout the state and presents all of the available data to March 1st from those precipitation stations of the U. S. Weather Bureau, state, districts, and public utilities located in the mountainous portions of the various stream basins.

The water content of the snow as determined at the various snow courses on March 1st of this year in per cent of the water content on March 1, 1930 varies throughout the Sierra from 50 to 95 per cent and by stream basins is as follows: Upper Sacramento and McCloud (one course) 55 per cent; Feather (2 courses) 50 per cent; Yuba (4 courses) 75 per cent; American (3 courses) 70 per cent; Mokelumne (2 courses) 70 per cent; Stanislaus (3 courses) 65 per cent; Tuolumne (6 courses) 70 per cent; Merced (6 courses) 95 per cent; Mono (2 courses) 60 per cent; Upper San Joaquin (one course) 95 per cent; Kings (one course) 70 per cent.

In those few areas where snow surveys have been made a sufficient number of years to permit the development of "normals" the water content of the snow in per cent of the normal water content for the entire season (as of April 1st) is found to be: Yuba Basin (3 courses) 50 per cent; American and Mokelumne Basins (one course each) 45 per cent; Mono Basin (2 courses) 30 per cent; Upper San Joaquin Basin (one course) 40 per cent.

In the South Yuba Basin the records permit a comparison between this year's snow and that in 1924, the driest year of record. An average of two courses in this area indicates a water content of the snow on March 1, 1931, amounting to 145 per cent of the water content on March 1, 1924.

The data from the precipitation stations show the average precipitation to March 1st in per cent of the normal to the same date varying throughout the state from 50 to 85 per cent and by stream basins as follows: Upper Sacramento, McCloud and Pit, 50-60 per cent; Feather and Yuba, 55 per cent; American, 60 per cent; Mokelumne, 65 per cent; Stanislaus, 80 per cent; Tuolumne and Merced, 65 per cent; Mono, 60 per cent; Upper San Joaquin, 55 per cent; Owens, 50 per cent; Kings, 55 per cent; Kaweah, 65 per cent; Kern, 70 per cent; Santa Ana and Los Angeles, 75 per cent; and San Gabriel, 85 per cent.

vision has already been made for other armories at Pasadena, Salinas and Yuba City and additional similar projects at San Jose and Fresno are under consideration.

The importance and dignity of the National Guard is by this practical means getting continuously increasing recognition from the State.

Data is Asked on Grade Crossing Cost Distribution Practices In Other States

FOR the purpose of obtaining comprehensive information as to the policies and practices of other states in the protection of grade crossings, and as to how the cost of such protective equipment and construction is provided for, the Transportation Division of the Railroad Commission has sent a questionnaire to all regulatory bodies having jurisdiction over grade crossings throughout the country.

The object of the Commission is to ascertain how California compares with other states in this important work. An important feature of the questionnaire is an inquiry as to the apportionment of the cost of grade crossing protective work between the railroads and the political subdivisions, and especially in the case of grade separations.

In transmitting this questionnaire the Commission enclosed answers to the various questions as they relate to California conditions, showing the number of grade crossings in the State with special protective devices, and the general policies of the Commission in handling grade crossings and grade separation problems.

The following data in regard to California is furnished in the questionnaire:

Number of crossings protected with wigwags: with audible signals, 1,563; without audible signals, 36.

Number of crossings protected with flashing lights: with audible signals, 7.

Number of crossings protected by rotating stop-flash light signals: with audible signals, 3.

In the absence of an agreement between the parties the expense of constructing and maintaining grade crossings and installing protective devices generally is apportioned by the Commission between the railroad and the interested political subdivision as follows:

<i>At existing crossings:</i>	<i>Railroad</i>	<i>Political subdivision</i>
Cost of improving or widening a crossing -----	100% of crossing proper	-----
Cost of installing protective devices -----	100%	-----
Cost of maintaining protective devices -----	100%	-----
<i>At new crossings—railroads over highways:</i>		
Cost of constructing the crossing -----	100%	-----
Cost of maintaining the crossing -----	100%	-----
Cost of installing protective devices -----	100%	-----
Cost of maintaining the protection -----	100%	-----

At new crossings—highways over railroads:

Cost of constructing the crossing -----	100%	-----
Cost of maintaining the crossing -----	100%	-----
Cost of installing protective devices -----	-----	100%
Cost of maintaining the protection -----	100%	-----

The cost of grade separations in California is apportioned in most cases, except when covered by an agreement between the parties, as follows:

<i>At existing grade crossing to be separated:</i>	<i>Railroad</i>	<i>Political subdivision</i>
Cost of constructing the separation -----	50%	50%
Cost of maintaining the separation -----	-----	-----
	Track and supporting structure	Remainder

At new grade separations—New railroad and existing Highway:

Cost of constructing the separation -----	100%	-----
Cost of maintaining the separation -----	-----	-----
	Track and supporting structure	Remainder

At new grade separations—New highway and existing railroad:

Cost of constructing the separation -----	25%	75%
Cost of maintaining the separation -----	-----	-----
	Track and supporting structure	Remainder

At locations where existing separations are to be enlarged or improved:

Cost of construction -----	50%	50%
Cost of maintenance -----	-----	-----
	Track and Supporting structure	Remainder

IT'S ALL IN THE STATE OF MIND

If you think you are beaten, you are:

If you think that you dare not, you don't;
If you'd like to win, but you think you can't
It's almost a "cinch" you won't.

If you think you'll lose, you've lost,
For out in the world you'll find
Success begins with a fellow's will,
It's all in the state of mind.

Full many a race is lost

Ere even a step is run,

And many a coward fails

Ere even his work's begun.

Think big, and your deeds will grow.

Think small and you'll fall behind.

Think that you can and you will;

It's all in the state of mind.

If you think you're outclassed, you are;

You've got to think high to rise;

You've got to be sure of yourself before

You can ever win a prize.

Life's battles don't always go

To the stronger or faster man.

But soon or late the man who wins

Is the fellow who thinks he can.

—Clipped.

He: Yes, I changed schools.

She: Oh! I'm so glad. I never did like engineers, for they always leave blueprints on your neck.—
Aggievator.

TEXT OF REPORT OF GOVERNOR ROLPH'S STATE WATER CON- SERVATION COMMITTEE

(Continued from page 16.)

has badly overdrawn or exhausted the underground water supplies. In this area about 400,000 acres now under irrigation of a high type and supporting a large population are seriously short of water, and it is estimated in the Federal State report that unless new water can be brought in 200,000 acres of highly developed land worth \$50,000,000 and producing crops of an annual value of more than \$20,000,000, must largely go back to desert conditions. The Commission finds the Sacramento-San Joaquin relief project economically sound and goes on to state:

The Commission reached this conclusion without giving weight to the sentimental consideration that relief is essential if a large, highly developed and heretofore prosperous section is to be preserved. But that consideration is entitled to weight. Putting aside the loss of labor and capital already invested, it is not possible for these sections to go back in a large part to their original desert condition without a great toll of human misery and suffering. This misery and suffering will just as surely be present as if the calamity were one of earthquake or flood, and the occasion is as truly one which justly calls for governmental assistance if the communities themselves can not bear the burden alone. In this case we believe they can bear the burden, if this burden is thrown on all the portions of the State benefited and not entirely on the lands directly assisted. Even if this were not so, our recommendation would still be that the project was one worthy of State and Federal aid.

In Tulare County, about the center of this distressed area, some 10,000 acres have already been abandoned and assessed valuations are decreasing.

We believe, Mr. President, that a project of this kind, economically sound, involving no material increase in production, but rescuing 400,000 acres of valuable irrigated land from depreciation or destruction should be of more interest to the United States than an entirely new land project.

New water can best be brought into the Southern San Joaquin Valley by means of the storage of an equivalent amount in the Sacramento water shed. This brings us to new areas of distress with different problems.

While the Sacramento drainage produces more water than the Colorado and far more than the ultimate needs of its own basin, in its present unregulated condition the summer flow has dropped so low that salt water from Suisun Bay has worked up the channels of the Sacramento-San Joaquin Delta. This condition has resulted in curtailing irrigation to some extent and in endangering the whole delta section of over 300,000 acres of extremely fertile lands which produce crops valued annually at \$30,000,000, as well as creating a fresh water shortage in the industrial section along Suisun Bay. This situation has been brought about by several causes, chiefly upstream diversions for irrigation. For the same reason navigation has been badly impaired in the upper Sacramento River and more so in the San Joaquin River above the delta. At the same time flood control is a necessity in the Sacramento Valley and there is an existing project under way at this time to cost \$51,000,000 in which the United States, the State, and local interests each pay one-third.

The Government of the United States is as we feel directly concerned in the solution of the pressing water

problems of these areas, particularly because of its interest in navigation, flood control, reclamation and the rescue of existing developments from threatened destruction.

For ten years past the State has studied these water problems in great detail, and a general Sacramento-San Joaquin Valley plan to best overcome them has been presented. This plan has been reviewed by the best engineers of California, and by the engineers of the War Department and the Reclamation Bureau and there is substantial agreement as to its being the best solution.

Large storage on the Sacramento River at Kennett near the head of the valley would be provided. The stored water when released would flow down the river to the Delta and be available for transmission into the San Joaquin Valley. Storage would be necessary on the San Joaquin River at Friant, 30 miles north of Fresno, from which point a high line canal would be taken south 157 miles to the Kern River.

This plan, if executed, would solve all of the problems mentioned and have other advantages. It would materially assist navigation and flood control on both rivers, would eliminate the salinity trouble and would rescue and relieve the southern San Joaquin Valley from the destructive effect of water shortage.

This project is estimated to cost about \$160,000,000 total. The construction of certain items essential to the program costing approximately \$20,000,000 can possibly be safely deferred some years, however, the entire program should be authorized at one time.

Revenues from sale of water are calculated on the basis of the reasonable ability of the lands to pay and from sale of power at competitive prices. While these revenues are large they are not sufficient to meet the total annual costs, and the Federal State Commission concluded that the project could not be undertaken without State and Federal aid.

Basing computations on an interest rate not to exceed 3½% the project was found economically sound if all benefits direct and indirect were taken into consideration. The Commission then stated:

It is manifest that the Federal government alone can obtain money at 3½ per cent interest. It may well be that it can obtain or be willing to advance the money at a less rate of interest. It may also be that the Federal government will be willing to advance funds for construction of certain portions of the project without interest.

The Commission recommended that the project be financed and built by the United States and operated by the State as far as practicable, the State of California to guarantee the United States payment of interest and principal as due, less such amount as the United States would contribute on account of flood control and navigation. The difference between the annual costs and the revenues would be taken care of within the State.

The conclusions of the State reports are now completed. Reports are under way by the War Department and Bureau of Reclamation which we understand will be available shortly.

Mr. President, we are seeking your counsel and advice on all phases of this subject. Advice at this time will be particularly valuable since the California Legislature reconvenes late this month, will adjourn in April, and will not meet again until 1933. Without better information relative to the participation of the United States in this project than is now available it is doubtful if much can be accomplished in the 1931 Legislature.

We have available detailed information and would be happy indeed to explain any items further.

Washington, D. C., February 16, 1931.

Budgeting Is Urged for Highways

WASHINGTON, D. C.: In order to successfully carry out the mandate of the people in the great enterprise of road building, state highway officials are turning their attention more closely than ever to the proper budgeting of highway expenditures. This they conceive to be the first and most essential step toward keeping the road dollar at work where it logically belongs.

First, the necessary capital for highway construction, and second, the best and most effective and far-reaching use of that capital, according to a bulletin issued by the American Association of State Highway Officials, is the goal set for the new period upon which road builders are now entering.

At the recent annual meeting of State highway officials at Pittsburgh, the bulletin states, the matter of proper budgeting of highway expenditures was taken up as one of the important subjects for consideration and definite action.

A highway budget, it was agreed, should be defined as the total annual amount available for expenditures in each state for highway purposes, and should be adjusted to meet the annual requirements of maintenance and construction contemplated. Further, all road improvements should be made on a basis of present and probable early future earning capacity. No public works should be measured by immediate financial return, though this should be a major consideration in the selection of the character of improvement.

The wide variance in the present status of highway development in the several states, members of the Association agreed, prevents the adoption of uniform policies for securing the funds necessary for the annual budget. Generally speaking, however, these principles may be set forth as follows:

"States in the initial stage of highway development should issue bonds to defer that portion of the annual charge for construction which would overburden either the property or the road user.

"States where original construction programs are well under way can, in the main, finance normal new construction from current funds, utilizing bond issue funds to defer the cost of special projects.

"States where original construction is

largely completed are concerned chiefly with maintenance and reconstruction, and should depend on current funds save in cases of emergency.

"State highway bond issues should be serial in form and should mature over a period not exceeding 30 years.

"Highway bonds issued by a political subdivision of a state should be serial in form and should mature over a period not exceeding 20 years.

"Serial maturities should be arranged so that the annual requirements of principle and interest will be as nearly uniform as practicable.

"Sound financing requires that the retirement of state bonds, as well as the interest thereon, be provided for from the receipts of motor vehicle license fees and gasoline taxes, but the full taxing power of the state should be authorized to guarantee the principle and interest, not only as a provision in case of failure of these special levies, but also to secure a lower rate of interest from the purchasers of the bonds."

The above statements constitute the revised principles of highway administration and finance and may be taken as a safe guide for such work as may come up in the various states.

SOME COMPARISONS

Recent announcement of the crossing of the continent from New York to Los Angeles by "Cannonball" Baker in 60 hours and 51 minutes, reducing the previous record time by almost seven hours, suggests a comparison. The first trip between the same cities in an automobile was made in 1903 by Tom Fetch and required 61 days.

There were less than 25,000 automobiles in the country 25 years ago, while today there are more than 26,000,000. There were 153,000 miles of improved road a quarter of a century ago, of which but 144 miles had a high type of surface; today there are more than 600,000 miles of improved highway and another 500,000 miles of usable dirt road.

A new watchman had been employed to sit up nights by the road construction job and see that nobody made away with the red lanterns or other paraphernalia. When he was due to be relieved after his first night on the job, the foreman approached and asked him if everything was all right.

"Well, boss," said the new hand modestly, "I don't want to brag about myself, but I don't think I've done so bad for a beginner. I checked up on everything just before you came, and there's only one thing missing—the steam roller."

Romance for the Civil Engineer

By FRED GRUMM, Engineer of Surveys and Plans

TO A LARGE number of people there is a certain romance connected with engineering. In literature, other than the technical, the engineer is often clothed in glamorous surroundings more or less exaggerated as measured by the author's knowledge of such things. Aside from the exact and scientific nature of the work and methods, there is for many, however, a fascination about engineering work. Exploration, reconnaissance and investigation in new country, the search for feasible routes and favorable conditions necessary toward effecting new development of various kinds, such as highways, railroads, reclamation of land and water, power development, perhaps furnishes the most likely opportunity for the engineer in the development of his romantic urge. This may account for the particular attraction which the survey party offers to the younger engineer.

The surveys of our state highways, especially in new locations and in the heavier mountain areas, are an attractive endeavor for those of us who have the romantic turn sufficiently strong to survive the effect of time and the more prosaic and tedious work. Not only the newness of both country and experience constitute the attraction, but also the difficulties and hazards which the work entails. The difficulties are a challenge to the more venturesome, and overcoming them while contending with the hazards offers a sense of superiority and achievement.

The survey line often leads across and through deep, rugged canyons, over high mountains or runs along precipitous cliffs. Swift and dangerous streams must be crossed. Densely wooded or brushy country is encountered. The lives of several survey party members have been lost in recent years where such conditions prevailed. Crawling for three or four hours on hands and knees through growth so dense that a flashlight is necessary is an experience not soon forgotten. Hanging on the side of a 300-foot cliff taking measurements with only the unsteady support and security of a rope from above should provide



WHAT THE PICTURE SHOWS

Lines indicate some surveying problems and perils along the Feather River Highway, now in course of construction.

a thrill for anyone. Forging a swift treacherous stream of ice-cold water up to the waist on slippery granite rock or shifting sand brings fleeting thoughts of the insecurity of life.

The Horseshoe Bend section of the Kings River Canyon is so inaccessible that to properly carry on the survey it was necessary to first construct miles of trail up the canyon. The deep, rapid waters rush through this canyon between vertical walls sometimes rising to several hundred feet. Even the most venturesome and ambitious young "S. L." up in the Feather River Canyon will have had an opportunity to cut his eye teeth before he gets a chance to negotiate the famous "Onion Peel" cliffs.

To many of our engineers this hazardous feature of the work is appealing, to others just something in the course of a day's work. All of it is to one end: to accumulate the data and facts which will lead to the proper, economic road improvement to serve the traveler. These preliminaries are only incidental to the more prosaic work, the drudgery, the infinite detail study, the close application of attention and care necessary to produce the finished product.

Romance? Yes, we have it in our highway work. To those who know and understand the methods, there often comes a vision, as we drive along some spectacular road, of those who came before, who struggled with the wilderness, its difficulties and dangers, doing their share to provide the safe, wide way we now traverse in comfort.

HOW READING CAN HELP YOU

"Link up reading and action—that is the efficient way to read. Lord Kelvin bought a book on Heat, by a French scientist—Fourier—and it changed his whole life and led to many of his great discoveries. Faraday bought a book on chemistry and became the founder of the present Electrical Age. Westinghouse bought an English magazine and found an article on compressed air that gave him the idea of his air-brake that is now used in all the railways of the world. Henry Ford, too, bought a magazine and saw an article on 'Horseless Carriages' that started him on his way to become the most successful of all manufacturers. The man who does not read, in these days of quick changes and irresistible progress, drops behind and becomes an obsolete and insignificant unit in his trade. Reading is a ladder. You must read if you want to climb."—Herbert N. Casson.

"So you asked Geraldine to marry you?"

"Yes, but I didn't have any luck."

"Why didn't you tell her about your rich uncle?"

"I did. Geraldine's my aunt now."—*Humorist*.

"Sambo, I don't understand how you can do all your work so quickly, and so well."

"I'll tell you how 'tis, boss. I sticks de match ob enthusiasm to de fuse ob energy—and jes natchurally explodes, I does."—*Nashville Tennessean*.

Architects Named To Prepare Plans for Institution Buildings

ADDITIONAL architects since the announcement in the February issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS have been appointed by Colonel Walter E. Garrison, director of the Department of Public Works, to prepare plans for buildings in state institutions. This is in accordance with the policy of Governor Rolph to speed up the construction of public buildings as a means of bettering business and increasing employment. Appointments made between February 15th and March 15th and the buildings for which they will prepare plans are as follows:

Gilbert Stanley Underwood Co., Ltd., Los Angeles; Ward Building at farm, Norwalk State Hospital; Appropriation, \$75,000.

Walker & Eisan, Los Angeles; Dairy unit and patients farm cottage, Pacific Colony, Spadra; Appropriation, \$75,000.

Bennett & Haskell, Pasadena; National Guard Armory, Pasadena; Appropriation, \$50,000.

Martin A. Sheldon, San Francisco; Ward for untidy, Mendocino State Hospital, Talmage; Appropriation, \$90,000.

Sam Heiman, San Francisco; Additional class rooms, San Francisco State Teachers College; Appropriation, \$100,000.

Wm. A. Edwards, Santa Barbara; Training School, Santa Barbara College; Appropriation, \$70,000.

Powers and Ahnden, San Francisco; School and Gymnasium, Sonoma State Home; Appropriation, \$40,000.

Charles E. Perry, Vallejo, Laundry Building, Mendocino State Hospital; Appropriation, \$60,000.

Guy Koeppe, Salinas and Carmel; New Armory, Salinas; Appropriation, \$35,000.

ADVERTISING

A lion met a tiger

As they drew beside a pool.

Said the tiger, "Tell me why

You're roaring like a fool."

"That's not foolish," said the lion,

With a twinkle in his eyes;

"They call me king of all the beasts
Because I advertise."

A rabbit heard them talking

And ran home like a streak;

He thought he'd try the lion's plan,

But his voice was but a squeak.

A fox, come to investigate,

Had luncheon in the woods.

So when you advertise, my friend,

Be sure you've got the goods.

—*Metropolitan Mirror*.

On the old-fashioned, narrow highways, just wide enough for two cars to pass, many a time a couple of cars would collide. But now they're building highways much wider, enabling three or four cars to smash at one time.—*Judge*.

Progress Report of Activities

in the

Division of Water Resources

AS OF MARCH 1, 1931

EDWARD HYATT, Chief of Division

Irrigation District
Activities



Applications for
Approval of
Dams

Flood Control and
Reclamation



Reductions in Re-
quests for Water
Permits

IRRIGATION, WATER STORAGE DISTRICTS

Returns have been received from about one-third of the questionnaires sent out to irrigation districts requesting information for the purpose of assembling and correlating data relating to the activities of California irrigation districts during 1930.

Conferences were held with officials of the Hot Springs Irrigation District, Modoc County, the El Camino Irrigation District, Tehama County, and the Linden Irrigation District, San Joaquin County, for the purpose of consulting on matters connected with the economic operation of these districts.

The Richvale Irrigation District, Butte County, voted favorably on January 24 for a bond issue in the amount of \$515,000. Funds are provided in this issue for the purchase of an interest in the water rights and irrigation system of the Sutter-Butte Canal Company, a public utility serving a large area of land in Butte and Sutter counties.

The following matters were referred to the California Bond Certification Commission and favorable action taken by the Commission at its meeting held on February 7, 1931:

1. Approval of an expenditure by the Carpenter Irrigation District, Orange County, in the amount of \$17,960.58 for preliminary work on Santiago Creek storage dam.

2. Approval of an expenditure by the Serrano Irrigation District, Orange County, in the amount of \$17,297.38 for preliminary work on the Santiago Creek storage dam.

The Lindsay-Strathmore Irrigation District, Tulare County, has been given consent to enter into an agreement for the purpose of acquiring certain water rights necessary to the district.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Maintenance clearing of timber in the by-passes has been completed for the season as the money available has been exhausted. All of the major repair work to structures in the by-passes has been completed. The maintenance force has been reduced to eight men exclusive of pump operators, and they are engaged in miscellaneous routine maintenance such as inspecting bridges and structures and making minor repairs, cleaning drainage ditches, etc. The drainage pumps have been operated for short periods during the recent storms.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

All jobs of bank protection designed to protect against floods of the current winter have been completed. The last job completed was done in cooperation with Levee District No. 3 in Glenn County at a cost of \$1,400.

SACRAMENTO FLOOD CONTROL PROJECT

No actual construction work is now under way by this Department in connection with the flood control project construction. Plans and estimates are being prepared for project units to be constructed in the future.

The deputy in charge of flood control and reclamation attended one meeting of the Reclamation Board and one meeting of the Flood Control Construction Committee.

EMERGENCY FLOOD CONTROL AND RECTIFICATION OF RIVERS

Bank protection work at Twitchell Island in cooperation with Reclamation District 1601 has been completed. Fourteen hundred tons of quarry rock riprap were placed in a length of 600 feet at the junction of Seven Mile and Three Mile sloughs.

Arrangements have been completed for channel rectification work at the mouth of Little River in Humboldt County in cooperation with the Little River Redwood Company and the county of Humboldt. This work is designed to restore the mouth of the river to its original position and is estimated to cost \$5,025.

Funds have been provided for rectification work on the San Jacinto River near San Jacinto in cooperation with various landowners and the county of Riverside, amounting to \$3,150. A fence barrier supported on driven steel pipes, about 2100 feet long, will be constructed, the work to commence at once.

MOKELUMNE RIVER

The work of improving the flood channel of the Mokelumne River in collaboration with San Joaquin County has been discontinued. A small levee 1000 feet long on the McCauley Estate has been completed, eliminating a choked condition. The channel is now clear and in fairly good condition to receive the possible winter floods. About \$8,000 has been expended on this work by the State and county.

RUSSIAN RIVER JETTY

Repairs to the jetty structure have proceeded with funds furnished by the Division of Fish and Game. The quarry and railroad have been operating during the entire period placing additional rock in the jetty wall. The damage sustained by the structure during the winter storms consisted of breaking away of about

150 feet of track and timber wall, and damaging to some extent about 100 feet additional. The rock placed in the jetty originally is still in place and will be effective in completing the wall. In fact, the storms have improved this portion of the work by settling the rock to a foundation which will probably be permanent. An additional sum of \$22,500 has been made available for this work under chapter 60, Statutes of 1931, passed as an emergency measure. An average of twelve men has been employed during the past period.

SANTA MARIA RIVER

The county of Santa Barbara has contributed an additional \$1,000 for work on the Santa Maria River, making a total fund of \$10,000 of which \$7,750 has been expended in clearing the channel of tree growth to a width of 375 feet for the length of six miles. No work is now under way, but the balance of the money will be expended in the near future in additional clearing and channel rectification.

FLOOD MEASUREMENTS AND GAGES

The streams of the Sacramento and San Joaquin valleys have not yet reached a stage which would require flood measurements. All preparations for this work are complete and all gages maintained by this Division are now in operation.

DAMS

During this period the activities have been directed toward final inspection of existing dams with a view to their approval. Supervision has also been maintained on the construction and repairs of dams.

To date 742 applications for approval of existing dams are on file; 59 applications for approval of plans and specifications for construction or enlargement, and 128 applications for approval of plans for repairs or alterations of dams.

Applications received for approval of plans for repair or alteration:

Dam	Owner	County
Porter Estate	B. F. Porter Estate	Los Angeles
Toreson	F. W. and Mrs. J. V. Caldwell	Modoc
Upper Twin Lake	G. B. Day Estate and Plymouth Land and Live Stock Company	Mono
Lower Twin Lake	Hunewell Land and Live Stock Company, et al	Mono
Dexter Creek	Wm. Symons	Mono
Silva Flat	Homer C. Jack	Lassen
Sardine Lake	Archibald Farrington	Mono
Orr Creek	Pacific Gas and Electric Company	Placer

Plans approved for construction:

The plans and specifications for the Santiago Creek Dam in Orange County, under the joint ownership of the Serrano and Carpenter Irrigation Districts and The Irvine Company were approved.

Plans approved for repair or alteration:

Dam	Owner	County
Antioch	Town of Antioch	Contra Costa
Culbertson	Pacific Gas and Electric Company	Nevada
Lower Feeley	Pacific Gas and Electric Company	Nevada
Middle Lindsay	Pacific Gas and Electric Company	Nevada
Upper Feeley	Pacific Gas and Electric Company	Nevada
Bear River	Pacific Gas and Electric Company	Nevada and Placer
Dexter Creek	Wm. Symons	Mono
Los Serranos	Davidson Investment Company	San Bernardino

A large number of existing dams have been critically examined both as to design and actual construction conditions and have been found to meet the requirements of safety. Certificates of approval on these dams will be issued shortly.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

Twenty-six applications to appropriate were received during January, 1931. Sixteen applications were canceled and nine were approved. Fourteen permits were revoked and thirty licenses were issued.

Among the permits issued was one to Linden Irrigation District allowing the appropriation of 154 cubic feet per second and 40,000 acre-feet per annum by storage on Calaveras River for the irrigation of 12,330 acres in San Joaquin, Stanislaus, and Calaveras counties, at an estimated cost of \$105,000 and two to the Southern Sierras and Nevada-California Power Companies allowing the appropriation of 4999 acre-feet for power purposes by storage on Green Lake and Bishop Creek in Inyo County, at an estimated cost of \$70,000.

ADJUDICATIONS

Stanislaus River (Alpine, Calaveras, San Joaquin, Stanislaus and Tuolumne counties). In accordance with the provisions of Section 36d of the Water Commission Act, a Certificate of Water Right was issued to each owner of a right as set forth in the decree entered in the Stanislaus River Adjudication Proceedings.

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Case pending in the Superior Court of Shasta County, awaiting the Court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in Superior Court of Shasta County awaiting the Court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Special effort was made during the month to secure the remaining signatures to the stipulation for consent judgment. Action by the referee is being deferred awaiting word from the parties involved.

Davis Creek (Modoc County). Two exceptions to the report of referee in the Davis Creek case have been filed, and will be heard by the Superior Court of Modoc County on February 24, 1931.

Mill Creek (Modoc County). The report covering the administration of the tentative schedule of allotments which was authorized for the 1930 season has been completed and is in the hands of the State Printer.

Deep Creek (Modoc County). The Report on Water Supply and Use of Water on Deep Creek and Tributaries has been completed. This report covers the results of the field investigation made by the Division during the 1930 irrigation season and is being circulated among the Deep Creek water users prior to a conference to be held at Cedarville on March 17, 1931.

Franklin Creek (Modoc County). The tentative schedule of allotments for trial distribution during the 1931 irrigation season has been completed and will be submitted to the Franklin Creek water users at a conference to be held at Alturas on March 16, 1931.

WATER DISTRIBUTION

Reports on water master service for the 1930 irrigation season were completed for Little Shasta and Lower Shasta rivers (Siskiyou County) and Soldier Creek (Modoc County).

CALIFORNIA COOPERATIVE SNOW SURVEYS

During the early part of the last month a field trip was made to Yosemite, Sequoia, and General Grant national parks, for the purpose of instructing the new men of the Park Service to be used on the surveys during the present season. The standard methods for making the surveys were demonstrated at representative snow courses.

The office work during the past month on this project has comprised the compilations necessary to keep all precipitation and snow survey records to date, and the correspondence and computations required in the preparation and publication of the first monthly bulletin of snow survey and precipitation data. Arrangements were made with all cooperating agencies so that snow surveys were made the latter part of January at all of the key courses and the results of these surveys and the data to February 1st from all those precipitation stations of the U. S. Weather Bureau, the State, districts, and public utilities located in the mountainous portions of the various stream basins, have been incorporated in the monthly bulletin which was placed in the mail on February 10th.

It is to be noted that the main survey of all snow courses as a basis for forecasts of stream flow is made in the latter part of March and the present surveys cover only selected or key courses to furnish data in the nature of a progress report. The bulletin presents the results of the snow surveys and affords an opportunity for comparison with the snow pack as shown by the surveys of February 1, 1930, the latter being the first season of the State's entry upon work of this character. In some instances where snow surveys were made for a period of years prior to 1930 by agencies now cooperating with the State, it has been possible to develop tentative "normals" and in these cases the water content of the snow as measured at the first of February is given also in percentage of these seasonal normals.

In so far as generalizations for entire stream basins can be made from the as yet somewhat scattered and limited snow courses, the surveys indicate a water content of the snow on February 1st of this year in per cent of the water content at the same time last year, as follows: Upper Sacramento and McCloud (one course) 60 per cent; Pit (one course) 80 per cent; Feather (3 courses) 50 per cent; Yuba (3 courses) 105 per cent; American (3 courses) 90 per cent; Mokelumne (one course) 60 per cent; Stanislaus (3 courses) 85 per cent; Tuolumne (6 courses) 75 per cent; Merced (6 courses) 100 per cent; Mono (2 courses) 55 per cent; Kings (2 courses) 80 per cent; Kaweah and Kern (one course each) 85 per cent.

Reviewing the data from the precipitation stations, the precipitation to February 1st in per cent of normal is shown for the various stream basins about as follows: Upper Sacramento, Pit and McCloud, 60 per cent; Feather and Yuba, 55 per cent; American, 60 per cent; Mokelumne, 65 per cent; Tuolumne and Merced, 70 per cent; Mono (one station) 60 per cent; Upper San Joaquin and Kings, 60 per cent;

Kaweah, 65 per cent; Kern, 75 per cent; Owens—one station on Bishop Creek 85 per cent—Upper Valley (one station) 50 per cent—Lower Valley (3 stations) ranging from 10 to 50 per cent; Santa Ana, 70 per cent; San Gabriel and Los Angeles (Mt. Wilson Station only—January data for other stations not available to date) 60 per cent.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The work of the past month under this project has been confined chiefly to the computations necessary in the preparation of the report for the 1930 season covering all diversions, stream flow, return flow, etc., throughout the Sacramento-San Joaquin territory. The small amount of field work has included regular salinity observations, tide gage maintenance, and maintenance of tanks being used in a determination of the consumptive use of water of aquatic plants.

The salinity sampling has continued at thirty-one stations and tide gages have been maintained at eight points between Collinsville and Sacramento. The following are comparative salinity and stream flow data for 1930 and 1931.

Station	Salinity in parts of Chlorine per 100,000		
	January 30, 1931	January 30, 1930	
Bullhead Point -----	850	380	
O. & A. Ferry -----	61	5	
Collinsville -----	9	4	
Antioch -----	6	5	
Jersey -----	6	6	
Emmerton -----	2	3	
Webb Pump -----	5	8	
Discharge in second-feet			
Station	February 13, 1931	February 13, 1930	
Sacramento River at Sacramento -----	11,200	26,200	

WATER RESOURCES

VENTURA COUNTY INVESTIGATION

Work on this investigation has continued throughout the month. The placing of a better grade of registers at several of the important gaging stations referred to in last month's report is being done by the United States Geological Survey in conformity with the arrangements made by this Division for the placing of these registers.

SOUTH COASTAL BASIN INVESTIGATION

While not as yet fully under way considerable progress has been made in organizing this work during the past month and there are now ten engineers and geologists employed, mainly on two phases of the work, one being a digest of well measurements and coordination of the well measurements in progress and the other a study of the geology of the underground basins. A beginning has also been made in getting the quality of underground water through an agreement as yet not entirely completed in detail, between the Department of Agriculture and this office, whereby the laboratory of the department at Riverside is made available for analyses of samples. The work is to be done by the State but under the advice of the department and with the expectation that the scientists of the department will make interpretation of the results.

MOJAVE RIVER INVESTIGATION

This has progressed in a routine way during the month and the new work on determining evaporation and transpiration of water along the flood plains of

the river has been started in cooperation with the Division of Agricultural Engineering, U. S. Department of Agriculture. A progress report to September 1, 1930, has been written and will be available shortly. This of course incorporates only data and interpretation of such data.

NAPA VALLEY INVESTIGATION

Measurements of stream flow were made on Napa River, Rector Creek and Conn Creek. A reconnaissance was made of Dry Creek, Mill Creek, North Fork Napa River, and Carneros Creek in search of possible reservoir sites. A site on upper Dry Creek was the only one found which merits further study. Gages have been installed on Rector Creek, and it is expected a fairly accurate record of the discharge of that stream will be available at the close of the year.

SANTA CLARA VALLEY INVESTIGATION

A progress report covering this investigation was completed and mailed to interested parties early in the month. In addition thereto, a member of the staff attended a public meeting in San Jose called for the purpose of discussing the state and local water problems. No field work was required during the month because of the fact that rainfall was insufficient to start the streams flowing.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month. All water stage recorders were overhauled and adjusted in order to assure their proper operation.

Copies of the Progress Report on Pit River Investigation for the year ending September 30, 1930, were distributed to the Boards of Supervisors of Modoc and Lassen Counties, the Hot Springs Valley Water Users Association, the Big Valley Water Users Association, and to each member of the Permanent Committee of Pit River Investigation. The Permanent Committee has called a meeting of all interested parties to be held at Lookout on February 25 for a discussion of the contents of the report and other matters pertaining to the investigation.

WATER RESOURCES REPORTS

Rapid progress is being made upon the completion of reports of the water resources investigation covering a State water plan for the coordination, development, conservation and utilization of the water resources of the State as provided in Chapter 832 of the Statutes of 1929. Practically the entire staff of the Division formerly engaged on investigations in the Sacramento and San Joaquin Valleys, salt water barrier and salinity conditions has been concentrated upon the preparation of these reports covering the results of investigations made by the Division of Water Resources.

MISCELLANEOUS ACTIVITIES

1. A continuation of the check being made in connection with the investigation of lands riparian to the Sacramento and American rivers has indicated that the first figures reached for the riparian acreage will be reduced by about 25%. The reduction is due to further data afforded as to the original Spanish Grants, Swamp and Overflow Surveys, and Land Office patents, and to severance due to railroad rights-of-way held in fee simple rather than as easements.

2. A field trip was made during the past month by representatives of the State, the U. S. Army Engineers and the U. S. Geological Survey to locate gaging stations in the San Joaquin Valley. Locations were made on the San Joaquin River near Vernalis, and Newman, and on Oristimba Creek near Newman. The

Newman station has been maintained previously by staff gage and the Vernalis station by weekly recorder. The new installations will provide for long period water registers. The station on Oristimba Creek is entirely new. Locations were inspected at the debouchure of Los Banos and Banoche creeks, but suitable sites were not found. This work is a part of the program for the location of some eighteen new gaging stations and the installation of recorders at eighteen old stations throughout the Sacramento-San Joaquin drainage basin in accordance with a Federal-State Cooperative Agreement.

STATE HIGHWAY PROGRESS REPORT as of March 1, 1931.

C. H. PURCELL, Chief.

During the past period, contracts have been awarded, work advertised and plans and specifications commenced as shown in the following table:

Work placed under contract.....	\$1,477,000
Contracts pending—projects advertised.....	2,573,000
Work anticipated to be advertised during March	5,086,300
Total	\$9,136,300

PROJECTS COMPLETED

The contracts which have been completed and accepted during the past four weeks include the following:

San Bernardino—Barstow Highway: A new bridge has been erected across the Mojave River near Victorville. This bridge was placed on an improved alignment of the highway at the river crossing; the grading of the approaches to the structure having been completed in November of last year. The structure consists of one 270-foot steel truss span, five 51-foot and one 48-foot reinforced concrete girder spans, and has a clear roadway width of 34 feet. The new bridge replaced the old inadequate 250-foot span built by the county, some twenty years ago, on an inferior standard of alignment. The bridge and approaches were constructed at a cost of \$146,800.

Valley Route: On the Ridge Route in Los Angeles County, 12.5 miles of State highway has been widened and straightened by the paving of crescent shaped areas, adjacent to the existing concrete pavement, with bituminous macadam. This project was located at the southerly end of the Ridge Route between Castaic School and fourteen miles north, on the Los Angeles to Sacramento artery. The crescent shaped areas were the result of the continuous work of the State's highway forces in cutting back the mountain sides on the many blind curves of this mountain highway. The actual effect of placing these crescent sectors adjacent to the existing pavement is to straighten the alignment of the highway generally. The cost of this paving amounted to \$148,400.

East of Sierras Highway: On the Mojave-Owens Valley Road 15 miles, from Cinco to seven miles north of Ricardo, in Kern County, has been graded and surfaced with oil treated crushed rock. This project brings the last unimproved section between Mojave and the Owens Valley to a high standard of grade and alignment, with an adequate type of surfacing and carries the improvement to within five miles of Independence. Traffic is now afforded some 200 miles of

improved highway through Kern and Inyo Counties to recreational areas of the Sierra Nevadas with the hazards of desert travel minimized and distance and time materially decreased. The section just completed passes through the wierd and scenic Red Rock Canyon, a favorite winter recreation spot for many people from Southern California cities. This project was completed at a cost of \$277,900, much attention being given to desert drainage problems and protection of the roadbed from damage by cloudbursts.

Walker Pass Highway: The progress on another State Highway, in Kern County, which leads into the Owens Valley is noted by the completion of a contract for placing an 18-foot oil treated crushed rock surface on 14 miles of the Kern River Road between Cottonwood Creek and Democrat Springs. This surfacing cost \$147,800. The Kern River Road extends from Bakersfield to the Owens Valley via Walker Pass. The present improvement completes the surfacing of this road from Bakersfield to Democrat Springs. Until the time when this road is adequately constructed through the pass the bulk of traffic will remain recreational in character, travel being between Bakersfield and the various resorts in Kern River Canyon.

Redwood Park Highway: The construction of a graded roadbed 24 feet wide on two and a half miles of the beautiful mountain road which traverses California Redwood Park in Santa Cruz County was completed at a cost of \$136,600. This work was located between Waterman Switchback and Saratoga Gap and it is planned to complete the grading and surface the entire distance between these two points this year. Recently completed construction on the Skyline Boulevard and its lateral connections makes this Redwood forest accessible to one and one-quarter million people within less than three hours driving time.

Bay Shore Highway: The continued progress on construction of the Bay Shore Highway is noted by the completion of the paving with 40 feet of Portland cement concrete that portion of this route through South San Francisco. The five miles immediately south of this project was recently paved and the distance from Broadway in Burlingame to Fifth Avenue in San Mateo will be advertised for bids in the near future. The cost of the paving through South San Francisco amounted to \$103,500. Another step in pushing this alternate route down the peninsula from San Francisco to San Jose is accomplished by the advertising on February 11th of a project for the construction of a reinforced concrete girder bridge composed of three 27-foot spans and having a clear roadway width of 100 feet. This new structure will connect San Mateo and Santa Clara Counties by spanning San Francisquito Creek at Palo Alto.

BID OPENINGS

Bids were opened during the past four weeks on the following projects:

National Old Trails: The continued improvement of the trans-continental highway which enters California at Needles is noted by the opening of bids for the construction of a graded roadbed 36 feet wide and placing an oil treated crushed rock surfacing 20 feet wide along a new alignment 29 miles long between Essex and one mile south of Klinefelter. The cost of this section of this desert road will be \$548,000. A reinforced concrete overhead crossing over the tracks of the Santa Fe Railroad about two miles east of Essex was advertised for bids on February 11. Work on this route has been steadily pushed eastward from San Bernardino and by the completion of the present

project, this desert highway will present a modern standard of alignment and grade from San Bernardino to 11 miles from Needles.

Valley Highway: Bids for the reconstruction of nearly eight miles of the Los Angeles to Sacramento Highway, between Stockton and Houston School were opened on February 21, 1931. This project calls for the placing of a Portland cement concrete pavement 20 feet wide and widening the roadbed to 36 feet. The pavement will be placed on the graded roadbed between Stockton and Cherokee Station which was constructed on a revised alignment in 1927. At Cherokee Station this improvement will connect with the southerly end of the recently completed seven miles of concrete pavement between Cherokee Station and Harney Lane. From Harney Lane, through Lodi to Houston School, the old county road is to be reggraded and paved with Portland cement concrete. With the completion of this project, which will cost \$284,000, this important arterial will present a wide, modern, high-speed highway from Stockton to Sacramento.

HIGHWAY BIDS AND AWARDS FOR MONTH OF FEBRUARY

COLUSA COUNTY—Between Maxwell and the north boundary, 1.5 miles to be surfaced with pit run gravel. Dist. III, Rt. 7, Sec. C. A. Teichert & Son, Sacramento, \$12,446; D. McDonald, Sacramento, \$11,049; contract awarded to Harms Bros. Galt, \$9,715.

PLUMAS COUNTY—Between Paxton's and Keddie, 0.7 of a mile to be graded (line change), Dist. II, Rt. 21, Sec. B. F. C. Coats, Sacramento, \$52,663; Hemstreet & Bell, Marysville, \$51,433; Larsen Bros., Galt, \$55,200; Granfield, Farrar and Carlin, San Francisco, \$61,810; Finnell Co., Sacramento, \$53,475; H. H. Boomer, San Francisco, \$69,966; Young & Son, Berkeley, \$64,129; Chigris & Sutso, San Francisco, \$52,968; W. H. Hauser, Oakland, \$51,518; Chas. N. Chittenden, Napa, \$67,753; contract awarded to Morrison-Knudsen Co., Boise, Idaho, \$48,791.

SAN BERNARDINO COUNTY—Between 1½ miles east of Essex and 1 mile SW. of Klinefelter, grading and oil surfacing. Dist. VIII, Rt. 58, Sec. LMN. Jahn and Bressi Construction, Los Angeles, \$557,412; George Herz & Co., San Bernardino, \$521,325; Allied Contractors, Inc., Omaha, Nebraska, \$692,067; K. F. Knapp, Oakland, \$554,073; Isbell Const. Co., Carson City, Nevada, \$599,084; New Mexico Construction Co., Albuquerque, N. M., \$644,603; Hemstreet & Bell, Marysville, \$606,687; Merritt Chapman & Scott Corporation, San Pedro, \$559,814; A. Teichert & Son, Inc., Sacramento, \$567,324; Contract awarded to H. W. Rohl Co., Los Angeles, \$496,246.

SONOMA COUNTY—About 4½ miles north of Santa Rosa, timber bridge across Mark West Creek, consisting of six 19-ft. spans, two 16-ft. spans, surfaced with Portland cement concrete approaches and bridge. Dist. IV, Rt. 1, Sec. B. A. T. Howe, Santa Rosa, \$22,743; W. C. Colley, Santa Rosa, \$23,455; Ralph Hunter, Sacramento, \$19,551; Fred J. Maurer, Eureka, \$22,255; Smith Bros., Eureka, \$22,791; J. W. Hoopes, Sacramento, \$21,287. Contract awarded to Peter McHugh, San Francisco, \$19,366.

SAN JOAQUIN COUNTY—About 7.7 miles to be graded and paved with Portland cement concrete between Stockton and ½ mile north of Houston School (two sections, part between Stockton and Lodi and the other between Lodi and Houston School). Dist. X, Rt. 4, Sec. C. D. Clark & Henery Co., San Francisco, \$274,521; C. M. Ball, Porterville, \$264,817; Fredrickson & Watson Const. Co., Oakland, \$264,700;

Basich Bros. Construction Co., Torrance, \$256,197; Hanrahan Company, San Francisco, \$252,602; C. W. Wood, Stockton, \$260,058. Contract awarded to Jahn & Bressi Construction Co., Los Angeles, \$249,598.

ARCHITECTURAL AWARDS FOR MONTH OF FEBRUARY

AGNEWS STATE HOSPITAL—Ward Unit No. 2 at Farm, contract for general work awarded to J. P. Shepherd, San Francisco, \$194,500; contract for electrical work, same building, to Guilbert Bros. Electric Company, San Jose, \$7,229; contract for plumbing, heating and ventilating work, same building, to Hateley and Hateley, Sacramento, \$40,572.

MENDOCINO STATE HOSPITAL—Talmage Ward No. 7, contract for general work, to A. Nelson, San Francisco, \$41,435; contract for electrical work, same building, to Decker Electrical Company, San Francisco, \$826; contract for plumbing and heating, same building, to Ukiah Plumbing and Heating Company, Ukiah, \$7,171.

PACIFIC COLONY—Spadra Girls' Industrial Building, Administration Building, Hospital Building, contract for general work to Louis A. Geisler, Huntington Park, \$76,574; contract for plumbing, heating and ventilating work, same buildings, to Cooney and Winterbottom, Los Angeles, \$15,495; contract for electrical work, same buildings, to Baty Electric Company, Long Beach, \$4,100.

STOCKTON STATE HOSPITAL—Cottage for employees, contract for general work to Samuel Eyre, Tracy, \$19,339; contract for electrical work, same building, to Hild Electric Company, Stockton, \$1221; contract for plumbing and heating work, same building, to Jos. C. Black, Stockton, \$6,600.

DAM APPLICATIONS AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of February, 1931.

LASSEN COUNTY—McArthur Dam No. 256. Rod-erick McArthur, McArthur, owner; wooden dam, 8 feet above streambed with a storage capacity of 500 acre-feet, situated on Pit River tributary to Sacramento River in Sec. 36, T. 38 N., R. 7 E., M. D. B. and M., for diversion purposes for irrigation use.

SAN JOAQUIN COUNTY—Gilmore Dam No. 571. Dan M. Gilmore, Linden, owner; earth dam, 20 feet above streambed with a storage capacity of 505 acre-feet, situated on Unnamed Creek tributary to Mormon Slough in Sec. 9, T. 2 N., R. 9 E., M. D. B. and M., for storage purposes for irrigation use.

ORANGE COUNTY—Orchard Reservoir No. 794. Mrs. Susanna Bixby Bryant, Los Angeles, owner; earth dam, 24 feet above streambed with a storage capacity of 20 acre feet, situated on Santa Ana River in Sec. 28, T. 3 S., R. 3 W., S. B. B. and M., for storage purposes for irrigation and domestic use.

LASSEN COUNTY—Bieber Dam No. 254. E. G. Babcock, Bieber, owner; timber crib dam, 5 feet above streambed with a storage capacity of 100 acre feet, situated on Pit River tributary to Sacramento River in Sec. 22, T. 38 N., R. 7 E., M. D. B. and M., for storage and diversion purposes, for irrigation use.

LASSEN COUNTY—Fulcher Dam No. 156-3. West Side Irrigation Company, Bieber, owner; crib dam, 16 feet above streambed with a storage capacity of 50 acre feet, situated on Pit River tributary to Sacramento River in Sec. 3, T. 38 N., R. 3 E., M. D. B. and M.

SOLANO COUNTY—Lake Madigan Dam No. 14-2. City of Vallejo, Vallejo, owner; earth fill dam, 35 feet above streambed with a storage capacity of 1800 acre-feet, situated on Wild Horse Valley Creek tributary to

Green Valley Creek in Sec. 4, T. 5 N., R. 3 W., M. D. B. and M., for storage purposes for municipal use.

SOLANO COUNTY—Lake Frey Dam No. 14-3. City of Vallejo, Vallejo, owner; earth dam, 71 feet above streambed with a storage capacity of 983 acre-feet, situated on Wild Horse Valley Creek tributary to Green Valley Creek in Sec. 9, T. 5 N., R. 3 W., M. D. B. and M., for storage purposes for municipal use.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of February, 1931.

LASSEN COUNTY—Silva Flat Dam No. 232. Homer C. Jack, Bieber, owner; earth dam, situated on Juniper Creek tributary to Pit River in Sec. 23, T. 36 N., R. 9 E., M. D. B. and M.

MONO COUNTY—Sardine Lake Dam No. 532-2. Archibald Farrington, Mono Lake, owner; rock dam, situated on Walker Creek in Sec. 15, T. 1 S., R. 25 E., M. D. B. and M.

PLACER COUNTY—Orr Creek Dam No. 97-42. Pacific Gas and Electric Company, San Francisco, owner; rubble dam, situated on Orr Creek tributary to Dry Creek in Sec. 18, T. 13 N., R. 8 E., M. D. B. and M.

SHASTA COUNTY—Lake Grace Dam No. 97-92. Pacific Gas and Electric Company, San Francisco, owner; earth dam, in Sec. 4, T. 30 N., R. 1 E., M. D. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of February, 1931.

SHASTA COUNTY—Garner No. 1 Dam No. 222. G. L. Childs and A. P. Waller, Manton, owners; earth dam, 21 feet above streambed with a storage capacity of 34 acre-feet, situated on dry ravine tributary to Digger Creek in Sec. 8, T. 30 N., R. 2 E., M. D. B. and M., for storage purposes for recreation use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of February, 1931.

NEVADA AND PLACER COUNTIES—Bear River Dam No. 97-11. Pacific Gas and Electric Company, San Francisco, owner; gravity dam, situated on Bear River tributary to Yuba River, in Sec. 22, T. 15 N., R. 9 E., M. D. B. and M.

MONO COUNTY—Dexter Creek Dam No. 532. Wm. Symons, Laws, owner; earth dam, situated on Dexter Creek.

SAN BERNARDINO COUNTY—Los Serranos Dam No. 808. Davidson Investment Company, Long Beach, owner; dry rubble dam, situated on Orr Creek tributary to Dry Creek, in Sec. 18, T. 13 N., R. 8 E., M. D. B. and M.

LOS ANGELES COUNTY—Lower Franklin Dam. No. 6-14. City of Los Angeles, Los Angeles, owner; earth dam, located in Sec. 12, T. 1 S., R. 15 W., S. B. B. and M.

PLACER COUNTY—Orr Creek Dam No. 97-42. Pacific Gas and Electric Company, San Francisco, owner; dry rubble dam, situated on Orr Creek tributary to Dry Creek, in Sec. 18, T. 13 N., R. 8 E., M. D. B. and M.

LASSEN COUNTY—Silva Flat Dam No. 232. Homer C. Jack, Bieber, owner; earth dam, situated on Juniper Creek tributary to Pit River, in Sec. 23, T. 36 N., R. 9 E., M. D. B. and M.

ANYTHING TO ACCOMMODATE

Owing to a big rush of job printing and for lack of space, a number of births and deaths will be postponed till next week.—*Stockville Ledger*.

An infernal machine is the one that ambles along the middle of the road in front of you at about ten miles an hour.

WATER APPLICATIONS AND PERMITS

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of February, 1931.

MONO COUNTY—Application 6883. O. P. Dyar, 325 South Los Robles, Pasadena, California, for 150 gallons per day from Unnamed Stream tributary to Lake George and Owens River. To be diverted in Sec. 17, T. 4 S., R. 27 E., M. D. B. and M., for domestic purposes. Estimated cost, \$50.

CONTRA COSTA COUNTY—Application 6884. Associated Oil Company, c/o Humphrey, Seals, Doyle and McMillan, Attns., Standard Oil Bldg., San Francisco, California, for 20,000 gallons per minute from Hastings Slough tributary to Suisun Bay. To be diverted in Sec. 11, T. 2 N., R. 2 W., M. D. B. and M., for industrial purposes. Estimated cost, \$30,000.

SISKIYOU COUNTY—Application 6885. W. A. Sargent, Dorris, California, for 2.0 cubic feet per second from Cottonwood Creek tributary to Lower Klamath Lake. To be diverted in Sec. 7, T. 47 N., R. 2 E., M. D. B. and M., for irrigation purposes on 160 acres. Estimated cost, \$50.

SISKIYOU COUNTY—Application 6886. W. S. Hart, L. I. Herrington, John Tiedemann and C. D. Jones, c/o W. S. Hart, 520 K St., Sacramento, California, for 800 gallons per day from Unnamed Spring tributary to Kelsey, thence Scott, thence Klamath River. To be diverted in Sec. 21, T. 44 N., R. 11 W., M. D. B. and M., for domestic purposes.

BUTTE COUNTY—Application 6887. Shelley E. Lee, Biggs, California, for 3.0 cubic feet per second from Lateral "A," Reclamation District 833 tributary to Butte Creek and Sacramento River. To be diverted in Sec. 18, T. 18 N., R. 2 E., M. D. B. and M., for irrigation purposes on 160 acres.

HUMBOLDT COUNTY—Application 6888. C. H. Barkall, 5646 26th Avenue South, Seattle, Washington, for 25 cubic feet per second from 6 or 7 small streams, tributary to South Fork of Trinity River. To be diverted in Sec. 24, T. 5 N., R. 5 E., H. B. and M., for mining and domestic purposes.

TRINITY COUNTY—Application 6889. Donald K. Can and Joseph O'Donnell, c/o Donald K. Can, Burnt Ranch, California, for 1.0 cubic foot per second from Gray Creek tributary to Trinity River. To be diverted in Sec. 32, T. 6 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost, \$500.

LASSEN COUNTY—Application 6890. Western Pacific Railroad Company, Mills Bldg., San Francisco, California, for 0.4 cubic foot per second from Horse Creek, to be diverted in Sec. 15, T. 35 N., R. 7 E., M. D. B. and M., for industrial and domestic purposes. Estimated cost, \$16,700.

EL DORADO COUNTY—Application 6891. N. L. Apollino, Camino, California, for 0.044 cubic foot per second from Bush Creek, to be diverted in Sec. 4, T. 10 N., R. 11 E., M. D. B. and M., for irrigation and domestic purposes on 5 acres. Estimated cost, \$400.

SUTTER COUNTY—Application 6892. Andraec C. H. Schmidt, c/o Lawrence Schilling, Attorney, Yuba City, California, for 1.1 cubic feet per second from Feather River tributary to Sacramento River, to be diverted in Sec. 11, T. 14 N., R. 3 E., M. D. B. and M., for irrigation purposes on \$1.65 acres. Estimated cost, \$1,500.

SAN DIEGO COUNTY—Application 6893. Harry E. Cansey, Aguanga, California, for 5 gallons per minute from Unnamed Spring tributary to Tecmela Creek, thence Santa Margarita River, to be diverted in Sec. 20, T. 9 S., R. 2 E., S. B. B. and M., for irrigation and domestic purposes on 2 acres. Estimated cost, \$300.

STANISLAUS COUNTY—Application 6894. E. B. Henry, Route 3, Box 947, Modesto, California, for 0.7 cubic foot per second from Tuolumne River tributary to San Joaquin River, to be diverted in Sec. 7, T. 4 S., R. 8 E., M. D. B. and M., for irrigation and domestic purposes on 53 acres. Estimated cost, \$1,000.

TUOLUMNE COUNTY—Application 6895. W. C. Lehane, P. O. Box 94, Modesto, California, for 280 cubic feet per second from Stanislaus River, tributary to San Joaquin River, to be diverted in Sec. 10, T. 1 S., R. 12 E., M. D. B. and M., for irrigation purposes on 100,000± acres.

INYO COUNTY—Application 6896. Leo Kikut,

Olancha, California, for 2 cubic feet per second from Small Spring to be developed, tributary to Owens Lake watershed, to be diverted in Sec. 26, T. 18 S., R. 36 E., M. D. B. and M., for irrigation and domestic purposes on 80 acres.

SAN BERNARDINO COUNTY—Application 6897. Mrs. Effel Rudy, Fenner, California, for 0.2 cubic foot per second from Fenner Spring, to be diverted in Sec. 28, T. 8 N., R. 18 E., S. B. B. and M., for domestic purposes.

EL DORADO COUNTY—Application 6898. United States El Dorado National Forest, Placerville, California, for 800 gallons per day from Unnamed Stream tributary to Lake Tahoe, to be diverted in Sec. 21, T. 13 N., R. 17 E., M. D. B. and M., for domestic and fire protection purposes. Estimated cost, \$100.

EL DORADO COUNTY—Application 6899. United States El Dorado National Forest, Placerville, California, for 800 gallons per day from Doane Springs tributary to Lower Echo Lake, to be diverted in Sec. 2, T. 11 N., R. 17 E., M. D. B. and M., for domestic purposes. Estimated cost, \$150.

EL DORADO COUNTY—Application 6900. United States El Dorado National Forest, Placerville, California, for 3200 gallons per day from Bryant Creek tributary to South Fork of American River, to be diverted in Sec. 15, T. 11 N., R. 17 E., M. D. B. and M., for domestic and fire protection purposes. Estimated cost, \$500.

KERN COUNTY—Application 6901. Sophus D. Gunderson, Brown, California, for 0.25 cubic foot per second from Grapevine Canyon and seven springs or seeps tributary to Grapevine Canyon, to be diverted in Secs. 14, 15 and 23, T. 25 S., R. 37 E., M. D. B. and M., for irrigation, domestic and stock watering purposes.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of February, 1931.

EL DORADO COUNTY—Permit 3653, Application 6797. Issued to G. E. White, Woodland, California, February 5, 1931, for 200 gallons per day from Forni Creek, in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost, \$50.

SUTTER COUNTY—Permit 3654, Application 6670. Issued to H. S. Fasig and W. H. Saylor, Knights Landing, California, February 5, 1931, for 3.46 cubic feet per second from Sacramento River, in Sec. 14, T. 13 N., R. 1 E., M. D. B. and M., for irrigation on 276.81 acres. Estimated cost, \$4,000.

INYO COUNTY—Permit 3655, Application 6508. Issued to W. E. Gray, Beatty, Nevada, February 13, 1931, for 5.0 cubic feet per second from (1) Jail Spring, (2) Birch Spring and (3) Tuber Spring, in (1) and (2) Sec. 21, (3) Sec. 9, T. 20 S., R. 45 E., M. D. B. and M., for mining and domestic purposes.

PLUMAS COUNTY—Permit 3656, Application 6800. Issued to S. E. Colburn and A. E. Banks, Crescent Mills, California, February 19, 1931, for 1 cubic foot per second from Unnamed Spring, in Sec. 35, T. 26 N., R. 9 E., M. D. B. and M., for power and domestic purposes. Estimated cost, \$2,000.

SAN DIEGO COUNTY—Permit 3657, Application 6845. Issued to Division of Highways, Department of Public Works, Sacramento, California, February 19, 1931, for 0.012 cubic foot per second from La Posta Spring in Section 6, T. 17 S., R. 6 E., S. B. B. and M., for recreational purposes.

COLUSA COUNTY—Permit 3658, Application 6847. Issued to Mary E. Porter Gleason, Grimes, Calif., February 19, 1931, for 1.92 cubic feet per second from Sacramento River in Section 7, T. 14 N., R. 1 E., M. D. B. and M., for irrigation on 153.58 acres. Estimated cost, \$2,575.

MONO COUNTY—Permit 3659, Application 6742. Issued to Sarita Mining & Power Company, Bridgeport, Calif., February 19, 1931, for 1 cubic foot per second from Masonic Creek and 15 springs in Sections 15 and 16, T. 6 N., R. 26 E., M. D. B. and M., for mining and domestic purposes. Estimated cost, \$750.

MONO COUNTY—Permit 3660, Application 6759. Issued to Alley Age Products Company, Ltd., Whittier, California, February 24, 1931, for 3 cubic feet per second from Laurel Lakes, in Sec. 29, T. 4 S., R. 28 E., M. D. B. and M., for power purposes. Estimated cost, \$1,200.

DEL NORTE COUNTY—Permit 3661, Application 6446. Issued to C. J. Dumbolton, Holland, Oregon, February 25, 1931, for 12 cubic feet per second from West Fork Althouse Creek, in Sec. 32, T. 15 N., R. 6 E., H. M., for mining purposes. Estimated cost, \$1,000.

STATE OF CALIFORNIA

Department of Public Works

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Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



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1931

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“Not an Ugly Highway in California”

By FRANK A. TETLEY, Member, California Highway Commission.

CALIFORNIA is a beautiful State. There is a glory in its mountains and valleys; an attraction of coasts and beaches; a lure to its rivers, its lakes, its forests and its deserts that has made California a name to conjure with among the people and the nations of the world.

Probably because of long years of association with the trees and shrubs, the vines and the flowers of California, the beautification of our State highway system carries a peculiar appeal to me. I regard the preservation and the protection of the beauty of our State almost as a religious duty, imposed by a Divine Providence upon us. The enhancement of its beauty is a responsibility equally as great.

Each in his particular field is responsible for the manner in which this duty is performed in the field of State highway affairs. A particular heavy responsibility rests upon those of us who are immediately charged with the control of and supervision over these roads.

BASIC BEAUTIFICATION PRINCIPLES

In making our State highways beautiful, and at the same time practical as to maintenance expense, there are certain definite principles and policies that appeal to me as fundamental. These are:

First, our planting should be characteristic of California's plant life. We should use as far as is possible, trees, shrubs, vines and flowers that are native to and symbolic of the State.

I believe that all highways on which trees are to be planted and maintained by the State of California should be at least sixty feet wide, and all main arteries should be one hundred feet wide; this because traffic is becoming greater and greater, and it is certainly a great loss that on account of the narrow highways, to have all trees on at least one side of the highway destroyed at some future time so that the highway can be widened.

Second, great care and study should be made of the varieties of trees to be planted in the different locations. It would be foolhardy to plant trees that would make a success in a desert country in a district that has moisture or elevation. We have a great many wonderful trees for highway planting to select



FRANK A. TETLEY

from, and if planted in the right locations, where they are native, wonderful and beautiful results can be obtained. This also will make diversification of trees.

Care should also be exercised in the cost of maintenance of trees. The eucalyptus tree, although a native of Australia, is just as indigenous to California as it is to its home land. There are many varieties of this tree, and after once started, from my experience, they can be maintained for less money than any real tree on the highway. In most places in the State, after these trees are planted and

watered for a few years, they will take care of themselves as far as irrigation is concerned. The flowering eucalyptus is really not strong enough to be planted as a highway tree. It is a beautiful thing, and can be planted in coast districts between eucalyptus, and of the type that will be giant highway trees.

Another tree that is very beautiful, and is a native of California, is the live oak. This can be planted with success in localities where it grows naturally, and after started for a few years, can also be maintained at low cost.

We also have in the southern part of the State, many different varieties of palms, including the *Candieriensis*, *Washingtonia Robusta*, *Guadalupe*, *Cocos Plumosas*, that can be planted with success. In the northern part of the State I find a great deal of black walnut and London plane trees.

For our real desert countries, I think the most practical tree to plant, which can be maintained at low cost, is the Palo Verde. After these are started for a year or two, they require no water and care.

We also have many trees of different varieties that would make a beautiful setting in the districts they are adapted to: The pepper, elm, *Cedrus Deodara*, cork oak, Lombardy poplar, Jerusalem pine, magnolia, madrone, locust, acacia, and last, the St. John's bread tree, which I am afraid that unless watched, does not develop deep roots commensurate with the growth of the top.

Third, the method or mode of the planting should fit the individual need of the particular section of highway where the planting is to be made. In one case this outstanding need may be shade; in another case the problem may be to effectively hide a construction scar or some ugly roadside building; in still another case, trees may be planted to frame some commanding view of ocean or mountain peak, forest or waterfall.

Third, the planting along a highway should be so varied that the danger of monotony is avoided. The task is one that demands the combined cooperation of the landscape architect and the highway official. It is a task for both artist and engineer. The artist must see to it that the beauty of the highway is enhanced and emphasized by the character of the planting that is made, and that the purpose of the planting is accomplished. The highway engineer must make certain that the planting will not jeopardize the safety of the traveling public, nor interfere with the necessary expansion and development of the highway roadbed.

The task is further one in which both the State and its communities must cooperate. The whole burden cannot be thrown upon the

State. The fact must not be forgotten that the first duty of State officials charged with highway responsibility, is to move traffic with safety and dispatch, and that this in itself is a big job.

Experience has shown that the community organization lends itself in a splendid fashion to promoting planting, but generally speaking, does not function in caring for these plantings when made. Therein the State must step in.

Much must be done in California in the work of highway beautification, but there remains much yet to be done. Nor does this statement in any manner reflect critically upon those who have been in charge of State highway affairs. The pioneer builders, like all other pioneers, had little time and less money to give to the matter of highway beautification. Roads had to be built before they could be beautified.

PAST THE PIONEER PERIOD

While we are still in a highway building era (and the greatest in the history of California) we are well past the pioneer period. We can no longer justify an unattractive highway on the ground that we are too busy building roads to give thought to their adornment.

Nor should the first be forgotten, that a foundation has been laid for any enlarged program of highway beautification upon which we may now build.

State, County and communities have for years been working together in highway planting projects. This work has been limited in scope, but it has established a basis for further cooperative efforts.

The State through years of experience has established standards for roadbed widening that assure the fact that plantings can be made without danger that the trees planted will have to be cut down to make way for a widened roadbed before they have grown to maturity.

The State highway organization is thoroughly committed to the policy of preserving as far as it possibly can, the native trees and shrubs that grow along the highway right of way.

Here is a basis upon which State and County can proceed to build a more beautiful highway system.

The problem of highway beautifications, however, is not one of planting alone.

THE BILLBOARD QUESTION

The billboard question presents a difficult phase of this problem.

(Continued on page 19.)

Governor Rolph Signs Bills Providing Orderly Additions to State Highways

GOVERNOR JAMES ROLPH, JR., affixed his signature on Wednesday March 20th, to bills providing for the orderly addition of new highways to the State system. These measures have passed both houses of the Legislature by overwhelming vote.

One of the measures to which Governor Rolph affixed his signature was introduced into the Senate by Senators Edwards, Breed, Allen, Baker, Cassidy, Duval, Harper, McCormack, McKinley, Riley, Swing and Waggy.

A companion bill, also signed by Governor Rolph, was introduced into the Assembly by Assemblyman Kline of San Jacinto. The Governor attached his signature with a gold pen presented to him by a delegation of Plumas County residents headed by Superior Judge J. O. Moncur. This pen was spun from Feather River gold, and was quill shaped to symbolize the area of its origin.

The bills provide for total additions of 804 miles of secondary highways to the State system. The roads included are designated on the map accompanying this article.

The bills were based upon a report on the orderly addition to new secondary highways made by the California Highway Commission and the Division of Highways, Department of Public Works. This report in its turn was made in response to a resolution of the 1929 Legislature, instructing that much study and resulting recommendations be made.

The resolution above referred to directed the observance of the following principles relative to the inclusion of new roads in the State highway system:

1. Additions to the secondary highway system are to be made during the next two years totaling between 10 per cent and 12 per cent of the existing State highway mileage, and in the ratio of not less than three or four miles in the south to one mile in the north.

2. Additional mileage is to be included for budgetary purposes when necessary surveys are completed.

3. No change is to be made in the present statutory division of secondary funds.

The joint resolution provides qualifications for roads which might be properly included and added to the State highway system. Roads having such qualifications are:



Governor Rolph signs Edwards-Kline bills for the addition of secondary roads to State system. The bills were signed with a pen made from Plumas County gold and presented by the residents of that county. In the picture above J. O. Moncur (left) superior judge of Plumas County, and Senator A. H. Breed (right), president pro tem of the Senate, witness Governor Rolph's signature to the bills.

1. Highways now carrying a large volume of State traffic.
2. Highways affording relief to heavy traffic on present State roads.
3. Highways serving as important interstate links.

The prescribed requirements limit the additional mileage to from 10 per cent to 12 per cent of the present State highway mileage and divide same in the ratio of not less than three or four miles in the south to one mile in the north in order that a start might be made in equalizing existing discrepancy between the mileage of secondary State highways in the north and the south.

ROADS INCLUDED IN SYSTEM

The following statement shows the highways included under the bills signed by Governor Rolph and the reason for their inclusion.

A.—A highway from New Pine Creek on the California-Oregon State line to a connection with State Highway Route 28 near Alturas; 34 miles: Modoc County.

This road establishes a connection between the Oregon State Highway System and the Redding-Alturas lateral (Route 28) of the California State Highway System.

This project is a necessary link on an east of the Sierra routing. It is a designated Federal aid route. It was recommended for inclusion in the State highway system by the Highway Advisory Board in 1925. Oregon is improving its roads from Klamath Falls, from Bend and from Burns territory (the Yellowstone cut-off) to the state line at New Pine Creek. Oregon, with State and Federal funds, has practically completed a surfaced road from the Columbia River and also from Klamath Falls to New Pine Creek. They are or will be fast speedways through interesting country. The unimproved condition of the California extension is withholding from the public the potential value of these routes.

Within California the project will coordinate with the Redding-Alturas highway, and through the Alturas-Susanville route, with the Red-Bluff-Susanville-Reno lateral. In the future a connection from Lake Almanor to the Feather River road would extend recreational traffic further south.

The route qualifies as an interstate connection. Without it our present highway system lacks a direct connection to eastern Oregon.

B.—A highway from Quincy to a connection with State Highway Route 29, near Chats; 58 miles: Plumas and Lassen counties.

This project would form an addition to the Feather River road, State Highway Route 21, joining it to State Highway Route 29 near the latter's interstate connection with State of Nevada highways. Its inclusion in the State system will extend State jurisdiction over a section which must eventually be considered of State and interstate importance beyond present State highway termination. Within a few years Route 21 will provide the much advertised water grade arterial through the scenic Feather River to the county seat, Quincy. East of Quincy lies equally attractive country and favorable routing to interstate direct routes through Nevada.

National forest highway activities in cooperation with Plumas County aid, is completing on good standards a surfaced road east of Quincy as their funds permit. Limitations in county funds and in federal road designation will not enable local and federal agencies to complete the connection through Plumas and Lassen counties.

This project forms an integral part of the Feather River highway.

C.—A highway from State Highway Route 8, near Cordelia, via American Canyon to State Highway Route 14; 14 miles: Solano, Napa and Contra Costa counties.

Traffic between the Sacramento Valley and the bay cities does not find the direct and most advantageous passage from State Highway Route 8 to State Highway Route 14 over connected state highways. State Highway Route 7 is available via Martinez Ferry but a better road and the bridge facility induce almost exclusive use of the county highway from Napa wye to the Carquinez Straits. A state route should be established to serve adequately that important through traffic which changed conditions on crossing the straits have forced over county roads.

Proposed for inclusion as state highway is a favorable route from Cordelia south to State Highway Route 14 by way of American Canyon. This route is 5 miles shorter than via Napa wye and 9 miles shorter than via Martinez. It combines directness, uninterrupted travel, and safety. Through an ideal underpass site near Cordelia the one railroad crossing on the route will be separated, and grade crossings on the county route and in Vallejo avoided. The new location avoids the present disadvantageous passage over steep intersecting streets in Vallejo. Alignment and grades are excellent. The construction costs will be moderate.

The route qualifies for state inclusion because it will meet the necessity for a state highway that will serve a very large volume of state traffic now carried over a county highway. It is in the only practicable location that will provide this function with safety, directness and reasonable cost.

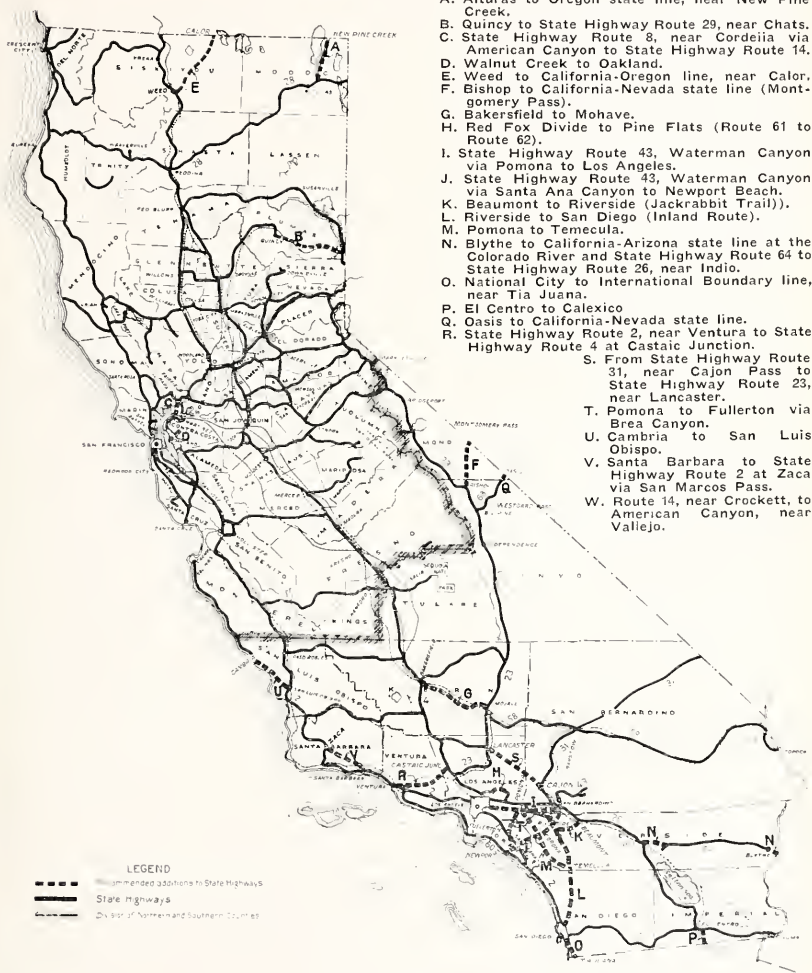
D.—A highway from a proposed Oakland tunnel to Walnut Creek; 9.6 miles: Contra Costa County.

Joint Highway District Number 13, composed of Alameda and Contra Costa counties, has organized for construction of a public highway and tunnel to supersede the present narrow, crooked and inadequate Tunnel road in Alameda County and improve the Contra Costa County road from the tunnel to the town of Walnut Creek.

Proposed for inclusion as a state highway is that portion of the route which lies in Contra Costa County between the tunnel and Walnut Creek, distance of 9.6 miles.

Basing calculations on the volume and class of traffic found on the present tunnel road and on the two State highways leading into Oak-

New Roads in Secondary State System



land, one from Livermore via Hayward and the other from Martinez through Crockett, and estimating the effect of better facilities easterly to Walnut Creek, the conservative twelve-hour traffic anticipated in 1940 on this project is equivalent to a twenty-four-hour traffic of 17,000 vehicles on Sundays and 10,000 on week days.

This route qualifies for state inclusion on volume, importance and character of present and of future probable traffic. It is logical to relieve Contra Costa County of this state traffic burden.

E.—A highway from State Highway Route 3 near Weed to the California-Oregon state line near Calor; 55 miles: Siskiyou County.

Geographic controls establish routing for the Pacific Highway through the north central portion of California. To reach the Klamath Lake Basin from this artery on improved roads requires a salient easterly through Oregon. The logical course for cutting this salient is a northeasterly diagonal departing from the Pacific Highway after the latter passes north of the summit near Mount Shasta. This diagonal has been recognized as a natural course on both railway and highway location. The highway routing proposed is 44 miles shorter than via the Shasta Canyon Highway over the Siskiyou Mountains.

It would depart from State Highway Route 3 near Weed and finds light construction conditions on a direct course to the Oregon Highway near Calor. The several intermediate summits are negotiated on moderate grades without losing direction and avoid adverse snow conditions better than on alternative routes.

The highway qualifies as an important interstate connection, as a route which will carry a large volume of state traffic and as one which is an economic alternative to another state route.

F.—A highway leading from Bishop, Inyo County, to a point on the California-Nevada state line near Montgomery Pass; 38 miles: Inyo and Mono counties.

This project is a routing from the Owens Valley to an interstate connection with Nevada state highway and is an alternative to State Highway Route 63. It is at present a county road. For a number of years the matter of decision on which of the two routes is preferable for ultimate interstate connection has been the subject of considerable investigation and discussion by California and Nevada road authorities. Neither California nor Nevada State Highway departments feel

that large outlay on the Westgard Pass Route other than by maintenance and minor improvement is warranted for the traffic served and are in accord in recognizing the superiority of the Montgomery Pass route. Nevada's procedure awaits some California state action in assuring permanent adoption of the route that must ultimately be chosen for practicable reconstruction.

The principal value of the route for state inclusion is for interstate connection, essential during winter months when it is the only practicable winter route between southern California and Nevada or the northern California and Oregon localities that are east of the Sierra. Future traffic will materially increase when the California and Nevada sections are improved. It qualifies as an interstate connection which will relieve the states of California and Nevada of expenditure of greater amounts on routes inferior in grades, directions and adaptability to serve traffic.

G.—A highway from Mojave to Bakersfield via Tehachapi Pass; 60 miles: Kern County.

Lying wholly within Kern County the road from Mojave to Bakersfield over Tehachapi Pass has been maintained as a county highway long since its serviceable condition has promoted thereon a class of traffic which readily qualifies it for state jurisdiction. It has outgrown its original function of supplying access to the county seat from the sparsely settled Mojave desert region and of giving means of egress to the several small settlements en route.

It is now considered an essential through route between the San Joaquin Valley and a wide area south and east of the Tehachapi Mountains. It joins State Highway Route 4 to State Highway Route 23 that runs north and south between San Fernando Valley and Owens Valley. At Mojave it connects with State Highway Route 58 which leads east for interstate connections via the Arrowhead Trail and the National Old Trail routes. It was recognized by the Highway Advisory Committee, in their report in 1925, as an important addition to the state system. Revision will make a marked improvement of the sharp curvature and steep grades on the present road. The distance is reduced from 66 miles to 60 miles.

The route is recommended as one important on state traffic classification. It is a passage over the Tehachapi range supplementing the Ridge route with relief thereto, is necessary for widely separated intercounty service, and is direct routing on interstate travel.

(Continued on page 20.)

April Bulletin of Snow Survey and Precipitation Data; Seasonal Forecast

THIS issue of the Division of Water Resources' monthly bulletin presents the results of the main snow survey for the season, covering some 160 snow courses throughout the Sierra; furnishes all available data to April 1st from the precipitation stations of the U. S. Weather Bureau, State, Districts, and Public Utilities in the mountainous portions of the various stream basins; and gives, based upon these data, the seasonal forecast for 1931 water supply.

Forecasts of stream flow are made at this time as the end of March is normally the period when the major storms have occurred and melting of the snow has barely commenced. Snow survey data at this time may therefore be taken as indicative of the April-July stream flow with later modification of estimates in accordance with subsequent storms, temperature and conditions.

A general summarization of all data shows:

1. The water content of the snow on April 1st of this year in per cent of the water content on April 1, 1930, varying from about 30 per cent for certain Owens Valley courses to about 70 per cent at courses in Merced basin with a general average throughout the Sierra of about 55 per cent.

2. For those few areas where snow surveys have been made for a sufficient number of years to permit the development of "normals," a water content of the snow in per cent of normal to April 1st almost as low as 10 per cent for one or two Owens Valley courses, nearly up to 50 per cent for Yuba basin courses and a general average of about 40 per cent.

3. The average precipitation to April 1st in per cent of normal to April 1st varying throughout the Sierra from 42 per cent for one station in Owens Valley to about 75 per cent for stations in Stanislaus basin with a general average of about 60 per cent, and an average for Los Angeles, San Gabriel and Santa Ana basins of 60 to 65 per cent.

4. The estimated 1931 seasonal stream flow in per cent of the 40-year mean (1889-1929) varying from 25 per cent for the Kings basin to 40 per cent for the Tuolumne basin with a combined figure of 33 per cent for the entire Sacramento and San Joaquin basins.

The data and estimates indicate for the Great Central Valley a water supply only better than the record low of 1924 by a small margin. It is to be anticipated, therefore, barring storms of most unusual magnitude and duration within the next few weeks, that

conditions of minimum stream flow with resulting salinity encroachment in the case of the Sacramento-San Joaquin Delta, may approach those of 1924.

FORECAST OF STREAM FLOW (APRIL 1, 1931)

FROM SNOW SURVEYS

These forecasts are made for those few basins or partial basins where the snow surveys have been conducted, according to the standard methods adopted, for a sufficient number of years to make it possible. (State of California Surveys began in 1930.)

YUBA BASIN

Area tributary to South Fork at Lungs Crossing (Lake Spaulding).

Water content of snow in weighted per cent of normal for area (using Lake Spaulding, Cisco, Furnace Flat, Lake Fordyce, Soda Springs, Meadow Lake, Red Mountain, Sawmill Flat, Lake Sterling, Summit and Webber Peak snow courses)

38%

Normal April-July run-off of South Fork at Lungs Crossing----- 249,000 acre-feet

Estimated 1931 April-July run-off... 95,000 acre-feet

Area tributary to Bowman Lake.

Water content of snow in weighted per cent of normal for area above Middle Yuba at Milton and mouth of Jackson and Canyon Creeks (using Bowman Lake, Findley Peak, English Mountain, Meadow Lake and Webber Peak snow courses) -----

37%

Normal April-July run-off for combined Jackson and Canyon Creeks and Middle Yuba at Milton (above Milton-Bowman tunnel diversion) 104,000 acre-feet

Estimated 1931 April-July run-off... 38,000 acre-feet

TRUCKEE, TAIHOE, CARSON AND WALKER BASINS

The forecasts for these eastern slope basins are compiled by the Forecast Committee of the Nevada Cooperative Surveys and have not been completed with this issuance of the bulletin.

FROM PRECIPITATION AND SNOW DATA

All available precipitation and snow data for the various basins have been analyzed to derive an estimate of the seasonal (October to September) stream flow in per cent of the 40-year average, 1889-1929, and these estimates are compared to the similar percentages

(Continued on page 24.)

Contractors Told Rolph Labor Program

THE employment of United States citizens on public works, who have been residents of California for at least a year; preference to married men in such employment; the maintenance of prevailing wage scales—these are cardinal points in the labor program of the Rolph administration, as outlined by Colonel Walter E. Garrison, director of the Department of Public Works.

Every contract signed by Colonel Garrison is accompanied by a letter to the successful contractor, requesting cooperation in making this program effective. Contractors as a whole have responded in a whole-hearted manner to Colonel Garrison's request.

The letters sent to contractors, in which this policy is definitely set forth, read as follows:

The enclosed contract, like most of the other contracts we are awarding at this time, is ahead of schedule. The object is to aid the unemployment situation in every possible way and to help to alleviate the present business depression.

Governor Rolph is very much concerned with this matter and has requested me to urge you to favor married men in the employment of your labor, as the burden of hard times falls heaviest on them. In this connection, we favor the policy of employing citizens of the United States who have been residents of the State of California for at least one year, and your efforts in this regard will be appreciated. It is also urged that you expedite this work as much as possible in order to lend your efforts in the recovery of business prosperity.

Another matter of much concern to the State at the present time and to the future prosperity of the nation is the matter of wage scale. It is our belief that the wages paid on this and other State contracts should be the prevailing wage in the locality, and we ask your serious consideration in dealing with this problem.

Your support in these respects will be very much appreciated.



COLONEL WALTER E. GARRISON

1930 FOREST FIRE RECORD

The fire-fighting organization of the forest service established a new record in 1930 in California by holding down the total area burned in the eighteen national forests in California to 35,000 acres. This was less than 20 per cent of the average annual loss from forest fires.

The average acreage burned annually in the California national forests is 188,000 acres, based on records for each year since 1909. The most disastrous year was 1924, when 551,000 acres were swept by fires. The only season that can be compared with 1930 for a low fire record is 1915, when only 41,000 acres burned.

"Do you know how to make a peach cordial?"
"Sure. Send her a box of candy."

HANDLING A WOMAN BY ELECTRICITY

A reader in New Jersey submits the following:

If she talks too long—Interrupter.
If she wants to be an angel—Transformer.
If she is picking your pocket—Detector.
If she will meet you half way—Receiver.
If she gets too excited—Controller.
If she goes up in the air—Condenser.
If she wants chocolates—Feeder.
If she sings inharmoniously—Tuner.
If she is out of town—Telegrapher.
If she is a poor cook—Discharger.
If she is too fat—Reducer.
If she is wrong—Rectifier.
If she gossips too much—Regulator.
If she becomes upset—Reverser.

—Hardware Dealer.

Lake Almanor Fish Hatchery

By CARL E. BERG, Engineer of Estimates and Costs, Division of Architecture

A FEW miles north of Lake Almanor, near Chester, Plumas County, stands the most recent of the Division of Fish and Game's fish hatcheries. This very appropriately has been named the "Lake Almanor Hatchery." From now on it will add its yearly quota of approximately four million trout fry to the many, many millions planted every year in California's streams and lakes by the Division of Fish and Game.



CARL E. BERG

Designed by the Division of Architecture to be built of California lumber to harmonize with its setting in California's highland, it provides not alone the best facilities for successful fish culture, but also comfortable quarters for

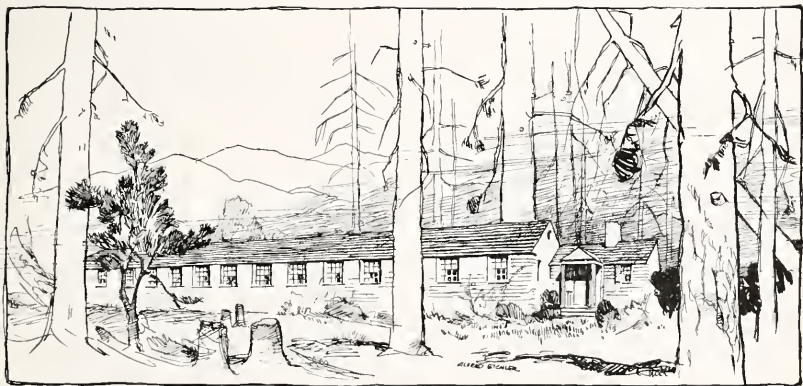
the man in charge and his family. The Red River Lumber Company of Westwood, California, who were the contractors, are to be complimented not alone for turning out a splendid job, but also for the speed with which it was done. Their construction force

under Mr. George Peltier, though carrying on the work in the winter months, completed their task in thirty working days, making it possible to have the hatchery finished in time for this year's hatching.

The hatchery itself is a frame building 40 feet wide and 150 feet long, well lighted, and affording ample room for 96 hatching troughs in which from early February, eggs from Rainbow, Lock Leven, Eastern Brook and Black Spotted trout will be hatched and the fry reared until ready for transplanting either into large rearing troughs or into streams and lakes of the surrounding country.

The all important cool, fresh water, without an abundance of which no fish hatchery can operate, is supplied by a never failing stream and, from behind a small concrete intake dam. A thousand feet of 10-inch riveted steel pipe carries by gravity 1000 gallons of water per minute into a screened and covered settling tank from which, after being freed from sand, leaves, etc., it flows into the hatchery head trough from where it is distributed through adjustable orifices into the hatching troughs.

Close to the hatchery is a comfortable cottage containing four rooms and bath, with running hot and cold water and wired for electricity, for the foreman in charge, and another cottage to house additional helpers will be erected later. A three-car garage pro-



Lake Almanor Fish Hatchery.

vides ample storage for the hatchery's trucks and automobiles, it also has a large storage room in one end for wood, etc.

The Lake Almanor Hatchery is the ninth large hatchery designed and built by the Division of Architecture for the Division of Fish and Game. The other eight are located throughout the State as follows:

Mount Whitney Hatchery, near Lone Pine, Inyo County.

Kaweah Hatchery, Kaweah, Tulare County. Yosemite Hatchery, Yosemite National Park.

Lake Tahoe Hatchery, Tahoe City, Placer County.

Feather River Hatchery, Clito, Plumas County.

Big Creek Hatchery, near Swanton, Santa Cruz County.

Cold Creek Hatchery, near Ukiah, Mendocino County.

Mount Shasta Hatchery, Mount Shasta, Siskiyou County.

All these hatcheries are open to the public. The Division of Fish and Game invites everyone to visit them and see how the work of keeping up the supply of game fish in California's streams and lakes is carried on.

Already hundreds of thousands of people avail themselves of this invitation every year and the Lake Almanor Hatchery will undoubtedly attract a large number of visitors. It is located but a few miles from Chester on the Red Bluff-Susanville highway, and easily reached over a good road.

One night, just before closing up time, Ole Olsen came running into the general store, hatless, coatless and breathless, and dropping on his knees yelled: "Yon, Yon, hide me, hide me! Ye sheriff's after me!" "I've no place to hide ye here, Ole," Yon Yonson, the proprietor, said.

"You moost, you moost," screamed Ole. "Crawl into that gunny-sack, then," said Yon. He had no sooner gotten hid than in ran the sheriff. "Seen Ole?" he asked.

"Don't see 'im here," said Yon, without lying. Then the sheriff went nosing around and pretty soon he spotted the gunny-sack over in the corner. "Whats in here?" he asked.

"Oh, joost some old harness and sleighbells," said Yon.

With that the sheriff gave the sack an awful boot. "Yingle, yingle, yingle!" moaned Ole.—*Pathfinder Magazine*.

A woman arriving in this country after a short visit to the continent was asked the usual question by the customs official at the landing port: "Anything to declare, madam?"

"No," she replied, sweetly, "nothing." "Then, madam," said the official, "am I to take it that the fur tail I see hanging down under your coat is your own?"

POEM IS MADE PART OF BID OF CONTRACTOR ON DESERT ROAD JOB

When bids were opened by the Division of Highways recently, the following poem was found attached to a bid upon a Mojave Desert highway project:

THE MOHAVE SINK

The Devil in Hell one time was chained,
And there a thousand years remained,
He never complained, nor did he groan;
Just decided to have a Hell of his own
Where he could torture to like degree
All living things, and watch with glee.

So he asked the Lord, "Have you land to spare
That you would sell at a price that's fair?"
The Lord said, "Yes, I have plenty, I think;
I left it all down around the Mohave sink.
In fact, Old Boy, the stuff is so poor
I doubt it could be used as a Hell any more."

The Devil examined it closely and well,
But reported the country too dry for Hell.
So the Lord, to get it off his hands,
Told the Devil He'd water the lands,
As He had some water no longer of use—
Stagnant old bog holes that stunk like the deuce.

The Devil, tickled, danced round and round
In the place that's called "The Devil's Playground."
The trade was made, the deed duly given,
The Lord went back to His home in Heaven.
"Now," the Devil said, "this is all I have needed
To make a Hell," and at once he proceeded.

He piled the sands in queer ridges and drifts,
Shattered the rocks into ragged sharp rifts;
Scattered in places, a sparse growth of brush,
Caused hot winds to dance with a staggering rush;
He put ugly bugs in the stale water holes,
Made the sun shine down like a bed of hot coals.

With foot-evil he troubled the long-horn steer,
And with ticks infested the poor creature's ear;
He crazed the bronco with the loco weed
And poisoned the feet of the centipede;
He hid chuckwallas in crevice and cracks—
Ugly old lizards with scales on their backs.

To the jackrabbit he gave unbelievable speed,
Told kit fox to starve or on jackrabbit feed.
Through miles of country where one can't make a road
He put thorns on the foliage and horns on the toad;
He filled the sands with scorpions and ants,
You can't sit down 'thout half-soles on your pants.

With colonies of tarantulas he peopled the hills,
Made turtles eat cactus in spite of its quills;
Over rough, rocky crags caused big horns to roam,
Made the canyon cave the lynx cat's home.
The howl of the coyote through the dead of night
Makes the wanderer long for the morrow's daylight.

With mirages he fools the thirsty one's eyes,
Till he's lost in the wastes and in agony dies.
One can't describe the fear that prevails,
Snakes walk on their bellies and talk with their tails.
Round through the hills he scattered some ore,
Put false signs here and there to indicate more.

"THE DESERT RAT."

Copyright (1927) by Elmer Proctor, Yermo.

Officer is Cited for Unusual Services

1 1 1 1 1 1 1

STATE Traffic Officer L. T. Torres of the Santa Clara County squad has been formally cited for unusual service rendered as an officer in a special order issued by E. Raymond Cato, Superintendent of the California Highway Patrol.

The service performed by the officer included the arrest of two notorious "stick-up" men on February 25th and a man wanted for murder on March 7th.

On the first occasion, the citation order said: Torres, unassisted, arrested Homer Cooper and C. W. Carson on a stolen auto charge. Questioning developed that both had engaged in 29 holdups in Los Angeles in one of which three hotel guests were wounded. They are also alleged to have confessed membership in a gang of five criminals in Kansas City, Mo., which held up two banks and killed a traffic officer who attempted to prevent their escape. Torres found three loaded pistols on the men when arrested.

On the second occasion Torres arrested George Weyrauch and William Slinger on a similar charge. Questioning by Captain John Pacheco developed that Weyrauch was wanted for the murder of a Tacoma, Wash., service station attendant and the wounding of his wife. Both were identified as the men who participated in a series of burglaries in Oregon.

Torres joined the patrol in November, 1930.

Highway Patrol Courtesy Column

Testimony from Flower Festival.

Mr. Thomas F. McLoughlin, Manager National Mid-winter Flower Show, Encinitas, San Diego County: The above named association held its annual six-day show recently at Encinitas and was visited by Governor James Rolph and Lieutenant Governor Merriam.

During the six days enormous crowds visited the show and traffic on the Coast Highway in the vicinity of the show tent was heavy and congested.

I wish now to state, on behalf of the directors of this show, that no management could have had better assistance than was rendered by Capt. Otto Langer and his group of splendid officers. Not one single accident occurred and comments were heard on



TRAFFIC OFFICER T. L. TORRES

all sides about the way these officers helped the motor traveling public.

Trial Crowds Well Handled.

From A. T. Dresser, Sheriff, Santa Cruz County: I want to take this means of thanking your department for the wonderful cooperation of your Santa Cruz County squad for assistance in handling crowds during the Thornehill trial when it was necessary to have uniformed men in the court room to handle the crowds, which were handled to my satisfaction and that of Judge Pullen of Sacramento, who sat in the case during the trial.

Through Captain Payton and his men we have had cooperation in other ways as well and I want to assure you that our office stands ready to assist your department at any time you need us.

Hold-up Men Arrested.

From M. B. Driver, Sheriff of Alameda County, to Raymond E. Cato, Superintendent of the California Highway Patrol: Your letter of March 7th, making inquiries as to the arrest and disposition of three men by the name of J. L. Montgomery, J. R. Murray and Henry Melvin, who were held to answer before Judge Chas. A. Gale of Pleasanton, this county, is received.

We beg to advise that on the night of February 6, 1931, it was reported to our deputies, Mr. L. E. Van Patten and Mr. Hugo Radbruch, who live in the east end of the county, that some hold-up men were at work in Dublin Canyon at Boomer Hill, near Dublin. In their investigation of this stick-up our deputies met two of your men, Mr. C. K. Gill and Mr. C. Avellar, and gave them a description, as best they could, of the car and occupants in which the hold-ups were operating. Later on Mr. Gill and Mr. Avellar stopped the car as described and found three occupants whose names we have already mentioned. They immediately got in touch with our deputies, who took charge of the prisoners and took them to the Livermore jail. The next day the prisoners were arraigned before Judge Gale of Pleasanton and bound over to the superior court for trial. These men are now awaiting trial in the Alameda County jail.

It is my desire to thank you, and through you, your officers, who rendered such valuable service in this matter.

Your letter stating that you have instructed your officers to cooperate with all peace officers is highly appreciated. Through cooperation we can accomplish very much that it is impossible to accomplish by each group of officers working entirely independently of all other groups.

Thanking you again for your cooperative spirit, and, if you will please convey my personal compliments to the two officers mentioned, I will thank you.

Exhibit Is Praised.

From D. E. Watkins, Secretary and General Manager, California State Highway Association: Permit me to comment favorably on the exhibit of the California Highway Patrol at the recent Pacific Automobile Show in Exposition Auditorium, San Francisco. I personally noted this exhibit and the excellent manner in which your staff took the opportunity of presenting to the motoring public the message of traffic regulation and highway safety. I hear many complimentary comments on this exhibit from my colleagues and from members of the California State Automobile Association.

Another noticeable feature was the courtesy of the members of your staff, Inspectors Charles D. Reade and Robert Coffey, Captain Albert O'Connor, and Patrolmen Otto Schramm, V. E. Dwelly, Avellar and Gill, who handled this work for you.

Squad Appearance Complimented.

From Seth E. Howard, Brigadier General, C. N. G., The Adjutant General: Permit me to express my sincere appreciation for the courtesies rendered to me upon the occasion of the visit of Governor James Rolph, Jr., to Riverside and San Bernardino for the opening of the National Orange Show. May I also take this occasion to compliment the excellent appearance of your detachment of State motorcycle police together with the fine manner of performance in riding in formation.

Officer Was Right on Job.

From D. P. Eicke, Stockton: I recovered the Ford car that was stolen from Stockton last Thursday and registered in the name of Mrs. D. P. Eicke, 673 Lexington avenue, in Modesto. I started for home and didn't get five miles when I was accosted by Officer C. A. Brink, whose star is No. 347. This was about five o'clock in the evening and the traffic was thick and speedy, yet as I pulled past he gave me the once over and the windshield mirror showed him whip out a book from his pocket and in less than a minute he had me off to the side of the road.

It was splendid work picking me out of all that traffic in such a short time. I wondered if you would drop him a card so that he might know that the public is appreciating such good officers.

Motorist in Trouble Aided.

From R. M. Colecolough, Sacramento: Two weeks ago, while driving on the Auburn-Grass Valley highway, I had brake trouble and was rendered prompt, courteous and efficient service by Officer Fonyer. Please be assured that the service is greatly appreciated.

Assistance Appreciated.

From R. L. Dunn, Jr., San Francisco: I wish to call your attention to a very courteous act which was performed by one of your motorcycle officers operating out of San Luis Obispo by the name of Donnelly. On last Sunday my wife and I were returning from Los Angeles, and were stuck, due to motor trouble, on the grade about six miles out of San Luis Obispo. This officer came along, and stayed with us three hours past his regular time of duty to aid us and the party who was working on the job in a very ticklish spot on the road. I was so thoroughly impressed with this man's attitude and conduct that I want to call it to your attention.

Give First Aid.

From J. F. Stephenson, Hollister: I am writing to congratulate you on having such an efficient officer as Mr. L. Hamilton in this territory. I was changing a tire recently when the lug wrench slipped and cut my hand quite badly. Officer Hamilton, who was passing, stopped and gave me first aid in a very efficient manner, enabling me to proceed on my way.

(Continued on page 24.)

Legislative Committee Reports

On California Water Problems

THE report of the Joint Committee of the Senate and Assembly dealing with the water problems of California was submitted to the Legislature on March 23d. This committee authorized by the 1929 Legislature was made up of the following legislators:

B. S. Crittenden, chairman, R. P. Easley, Edwin A. Mueller, Will R. Sharkey, Van Bernard, Frank W. Mixter, H. C. Nelson, Ralph E. Swing.

After dealing with the history of the water problem in California, and a detailed analysis of the problems and features that it presents, the committee recapitulates its findings as follows:

The following table sets forth the units proposed, with estimates of cost:

Kennett Reservoir, Afterbay and Power Plant	\$84,000,000
Contra Costa Conduit	2,500,000
Delta Cross Channel	4,000,000
San Joaquin Pumping System	15,000,000
Friant Reservoir and Power Plant	15,000,000
Aqueducts from Friant Reservoir	29,900,000
Rights of Way, Water Rights and General Expense	8,000,000
Total Great Central Valley	\$158,900,000
Santa Ana River Flood Control and Conservation Project	30,000,000
Grand total initial plan	\$188,900,000

In the report of the legislative committee of 1929, rather a complete statement of policies were suggested in State activities along these lines. We wish to reaffirm the policies set forth in that report.

We desire to reassert with reference to Mountain Problems of Northern and Central California that the foothill sections of Northern and Central California have furnished much of the basic wealth of our State and should not be overlooked in the development of water resources of those parts of the State. It is important that the State retain such authority over the water coming within its control as will insure a sufficient supply for use within the watershed where such water originates when and as the same may be needed and reasonable provision should be made for maintaining the mountain streams of such territories in the interest of and for the protection of fish and game and for supplying the reasonable demands of outdoor recreation and sports and the demands for all other beneficial uses. Economically speaking, lands farthest from market and from centers of population and land difficult of development are among the last to be brought under cultivation and unless provision is now made for caring for the demands of these lands as well as for the other beneficial uses when and as needed, the right for use for such purposes may be lost. Of the waters brought under control of the State the right of use of such part thereof as may be reasonably antici-

pated as necessary for supplying and caring for all the aforesaid uses should at this time be reserved, and allotted for such uses as required. In supplying areas of deficiency of water from areas of surplus only such water as is not needed to serve vested or other property rights, or necessary for supplying the uses and purposes hereinbefore mentioned should be considered and no water should be diverted from the area of origin which is now or which may ever be required for any beneficial use within such area of origin.

FINANCING

Your legislative committee in 1929, on the subject of financing, reported in part as follows:

"We feel that the Federal Government is interested in the development of Kennett, upon the grounds of its well established policies regarding navigation and flood control. Therefore, every effort should be put forth toward the adoption of the program of construction hereinbefore mentioned to obtain Federal aid. Whenever such Federal aid is obtained it should inure to the benefit of the State in repayment of the amount of money which the State may have advanced or reducing the amount of bonds to be sold in the construction of Kennett and the San Joaquin Valley project.

"We recommend that the Legislature memorialize Congress to at once investigate the need for this development and to approve the same and appropriate such sum or sums as it deems just in the premises."

In considering the question of financing this development the amount of money involved at first seems overwhelming; however, when we compare that investment with that which we make for our State highway system and compare the direct economic benefit to the State as a whole as well as to great numbers of private individuals, there is little doubt that the investments for water conservation would directly return to the people generally a greater economic benefit.

The money involved should be considered on the basis of an investment, not on the basis of the expenditure of money for social, political or educational purposes. It will not impair the credit of the State; it will increase it, because it directly increases the volume of property in the State.

Considering the amount of money involved from the standpoint of investment the question to be considered is:

What is it worth in dollars and cents to the property values of the property included in the State of California to have this investment made?

The difference between a copious supply of cheap water for agriculture, industry and domestic necessity and a scarcity of water for such purposes is directly illustrated in the difference between desert or semi-desert and highly developed properties containing orchards, dairies, cities and towns. The removal of the salt water menace around the great metropolitan centers and in the delta will be reflected in millions of dollars of increased value in property. To illustrate, the difference in being able to obtain liberal bank loans on land and not to be able to obtain

them scarcely at all, to be able to have ample supply of water in the fertile lands of the counties of the southern San Joaquin or to have shrinkage of population, withdrawal of loans, decrease in all business activities. Ample supply of water will be reflected in increased transportation, increased consumption of products, increased growth in the cities, bank deposits, increased activities in everything that goes to create a healthy economic condition.

To our minds the investment of the money herein mentioned would be reflected before the construction could be completed in increased State, Federal and county taxes sufficient to justify the investment even though the entire sum were paid by the State and Federal governments.

This is not a fanciful theory or a new idea in government. Many of the oldest countries in the world have owned, operated and furnished to the public their public water developments, because of the State's interest in the same.

In the early history of California when its population was sparse it was possible for individuals to develop their own water supply or for improvement districts comparatively small in size to do the same. This condition has changed. The local supply has been depleted and now it becomes necessary in all development to take into consideration the entire picture.

Speaking more definitely in regard to northern California project we believe the State and Federal governments should each contribute heavily toward these developments, that the Federal Government is justified from the standpoint of navigation, flood control and reclamation in contributing at least \$20,000,000 toward the entire amount; that the State as it becomes necessary should match this amount; that the original money should be advanced by the Federal Government and that the State should guarantee the repayment to the Federal Government in all sums in excess of the amount of \$20,000,000.

We recommend the advancement of money by the Federal Government and the guarantee of the return of the same by the State, and the guarantee should be made when the State has succeeded in entering into contracts with responsible parties for the repayment of all of said moneys and interest within a period of fifty years or thereabouts. That the State should be given power to enter into contract with persons, corporations, cities, counties and districts, for the purchase and sale of power and water and that in general the State should take over the direction, control, management in a general way of the construction and operation of all of the units in the central basin of California. That it should be given quite liberal power in the negotiation of such contracts on such terms as the Legislature may from time to time prescribe.

We believe that the Federal Government should be called upon to furnish the money at a very low rate of interest of approximately 3½ per cent and that some money should be furnished the San Joaquin unit free.

The Santa Ana project should be worked out on the same basis as flood control and reclamation problems of the Sacramento Valley were solved. That is one-third be paid by the State, one-third by the Federal Government and one-third locally.

We recommend that suitable constitutional amendments be introduced and adopted at this session of the Legislature authorizing the carrying out of the recommendations hereinbefore made. We further recommend that a special tribunal be created for the determination and appraisal of water rights and other properties that might be involved in such development.

We recommend that great care be given to the

Governor Signs Gasoline Tax Collection Laws

LEGISLATION designed to tighten up the gasoline tax collection laws and prevent oil companies from defrauding the State out of tax has been approved by Governor Ralph.

The gasoline tax bills were introduced by Senator Arthur H. Breed, Piedmont, after the state board of equalization disclosed that approximately \$1,250,000 was due the State in delinquent taxes.

Four amendments were written into the State gasoline tax act, as follows:

1. Collections to be made by the State monthly, instead of quarterly as at present.
2. Oil firms must post bonds guaranteeing payment of the levy.
3. Tax laws strengthened to prevent the sale of gasoline in California, which previously was reported as exported.
4. Preventing unauthorized blending of motor vehicle fuel, by demanding licensing of all producers and brokers dealing in products which may be made into gasoline.

The tax evasions were caused by dealers who reported the gasoline as being sold for export, and then sold it in California, and the fact that some small firms were forced to the wall by periodic gasoline wars leaving these taxes unpaid.

Sambo, a southern darkey, married Liza. In about two weeks he came to the reverend gentleman who had tied the knot, looking as if he had lost his last friend in the world.

"What's the matter, Sambo; aren't you happy?" the preacher inquired.

"No, suh, pahson. Ah wants a divorce."

"I'm sorry to hear that, Sambo, but you must remember that you took Liza for better or worse."

"Ah knows dat, pahson, but she's wuss den ah took her fo'."

The weatherman dreamed that himself was dead; That he stood by his monument, tall, and read The message thereon—and he hung his head, For "Probably Warmer" was all it said.

protection of the present and future needs of all portions of the State where water may be stored and from or through which it may be diverted from its natural course or courses, that it be understood to be fundamental that it is not only wrong but economically unsound to injure materially one section in order to benefit another.

We urge that prompt action be taken, that in so doing great care and consideration be given to the needs of all who may be affected. We believe it to be a short-sighted policy, however, for districts not immediately benefited to fail to take interest in this State-wide plan.

State-County Road Mileage Study

The California Highway Patrol today announced the results of a survey of road mileage in California. Taken to provide the basis of studies for a more adequate and equal distribution of traffic officers.

The survey was announced as covering both paved and unpaved county and state roads in each county. The information thus secured is to be used for an index system combining factors relative to accident hazard such as population and traffic density, motor vehicle registration, etc.

The patrol's survey, based on statistics gathered by traffic officers in the various counties, showed a total of 74,492 miles of public highway in the state.

This figure, which does not include city streets or private roads is divided as follows: Paved county roads, 8970; unpaved county roads, 59,184; paved state roads, 4118; unpaved state roads, 2219.

Under paved roads are listed all concrete-asphaltum, concrete, and macadam roads. Under unpaved roads are listed all dirt, graveled, graded and oiled roads.

Tulare County with a total mileage of 4650 leads the list of counties. Fresno County is second with 4569. Other counties are shown by the following table:

County	County roads			State highways			Grand total
	Paved	Unpaved	Total	Paved	Unpaved	Total	
Alameda.....	177 79	334 70	512 49	57 10	57 10	569 59	
Alpine.....	32	32	64	086	67 10	99 10	
Amador.....	8	368	376	44 236	58 364	478 60	
Butte.....	362 52	1,078 79	1,441 31	65 09	42 21	1,548 61	
Calaveras.....		295	295	33 894	66 306	335 20	
Contra Costa.....	173	417	590	21	21	611	
Colusa.....	55	660	715	57 608	20 392	793	
Del Norte.....		164	164	81 426	12 674	258 10	
El Dorado.....	157	1,093	1,250	52 829	93 471	1,396 30	
Fresno.....	286	4,200	4,486	59 379	24 221	4,569 60	
Glen.....	40	1,160	1,200	51 69	8 31	1,260	
Humboldt.....	67	1,161	1,228	128 618	81 782	1,468 40	
Imperial.....	73 5	2,426 5	2,500	152 50	152 50	2,652 50	
Inyo.....		608	608	99 19	70 81	170	
Kern.....	199	2,761	2,960	227 145	129 755	3,316 90	
Kings.....	112	1,510	1,622	30 80	30 80	1,652 80	
Lake.....	28 5	571 5	600	50 769	36 831	687 60	
Lassen.....		1,650	1,650	47	60 90	1,757 90	
Los Angeles.....	1,307 56	2,419 69	3,727 25	203 544	49 856	3,980 65	
Madera.....	61	1,459	1,520	44	44	1,564	
Marin.....	74 9	228 1	303	38 5	4 60	346 10	
Mariposa.....		1,000	1,000	40 189	16 511	1,056 70	
Mendocino.....		357	357	139 53	50 17	546 70	
Merced.....	135 50	1,774 50	1,910	91 80	91 80	2,001 80	
Modoc.....		739	739	10 315	72 885	822 20	
Mono.....		280	280	12 585	131 015	423 60	
Montgomery.....	262	799	1,061	117 074	63 026	1,241 10	
Napa.....	80 3	384 7	465	26 30	26 30	491 30	
Nevada.....		525	525	65 27	51 03	641 30	
Orange.....	244	680	924	71 20	71 20	995 20	
Placer.....	100	605	705	124 69	1 71	831 40	
Plumas.....		246	246	9 30	39 90	295 20	
Riverside.....	281 05	1,870 32	2,151 37	120 741	59 459	2,331 57	
Sacramento.....	283	1,717	2,000	89 609	5 391	2,095	
San Benito.....	40	407 25	447 25	27 90	27 90	475 15	
San Bernardino.....	438 7	2,319 3	2,758	234 204	255 296	3,247 50	
San Diego.....	183 53	2,304 37	2,577 90	93 002	24 898	2,696 70	
San Francisco.....	630	240	870	2 20	2 20	872 20	
San Joaquin.....	670	1,500	2,170	103 163	1 137	2,274 30	
San Luis Obispo.....	78	1,125	1,203	117 854	36 746	1,357 60	
San Mateo.....	95	45	140	75	75	215	
Santa Barbara.....	555	175	730	96 527	35 073	861 60	
Santa Clara.....	266	884	1,150	99 350	8 25	1,257 60	
Santa Cruz.....	125	375	500	26 280	28 42	554 70	
Shasta.....	8	1,856	1,864	109 42	74 68	2,048 10	
Sierra.....		200	200	1 65	28 85	230 50	
Siskiyou.....	33 5	1,256	1,289 5	66 309	115 591	1,471 40	
Solano.....	43	690	733	69 10	69 10	802 10	
Sonoma.....	265	1,235	1,500	93 50	93 50	1,593 50	
Stanislaus.....	160 75	1,001 25	1,162	49 50	49 50	1,211 50	
Sutter.....	193	542	735	28 50	28 50	763 50	
Tehama.....		916 75	916 75	100 74	29 76	1,047 25	
Trinity.....		340	340	704	112 806	453 60	
Tulare.....	208	4,347	4,555	95 488	112	4,650 60	
Tuolumne.....	30	245	275	34 358	122 242	431 60	
Ventura.....	239 55	346 1	585 65	61 20	61 20	646 85	
Yolo.....	80	730	810	48 30	48 30	845 30	
Yuba.....	60	420	480	18 06	26 64	524 70	
Total miles.....	8,970 65	59,184 82	68,155 47	4,118 506	2,219 094	74,492 87	



State of California

GOVERNOR'S OFFICE

SACRAMENTO

March 6, 1931

JAMES ROLPH, JR.

GOVERNOR

Mr. Thos. E. Stanton, Jr., President,
California State Employees' Association,
Room 404 B, State Capitol,
Sacramento, California

My dear Mr. Stanton:

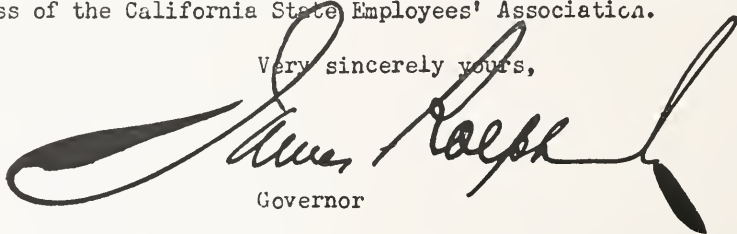
I was very glad to receive your letter of February 25th, setting forth the purpose of the California State Employees' Association, and desire to commend the employees of the State for their initiative in taking this step.

Throughout my entire period of public life, I have been most interested in the welfare of the public employees. I actively sponsored the retirement and civil service measures in the City of San Francisco.

Organizations such as yours can be a source of much good when conducted along proper lines, free from political motives and entanglements. Let me urge your Association to always maintain the high ideals set forth in your Constitution.

I sincerely appreciate your kind assurance of cooperation and support in making my administration a successful one, and in return desire to assure you of my confidence in the sincerity of your purpose. You may convey to the employees of the State my cordial good wishes for the success of the California State Employees' Association.

Very sincerely yours,



Governor

Press Comment on State Highway Affairs

Highway Commissioner Commended.

That a good public servant is not without honor even in his own country is evidenced by the following article appearing in the *Riverside Enterprise*:

Frank A. Tetley, State Highway Commissioner, was honored Monday by the Board of Supervisors with a resolution in return for the manner in which he is supporting an adequate southern California highway program, particularly in Riverside County.

Mr. Tetley is giving a great deal of his time to legislative matters affecting all of this part of the State, particularly those in Riverside County. His many years of business operations in all parts of the southern counties qualify him to understand the problems to be met better than most public officials.

The recognition by the county supervisors of just what he is doing is merited.

Illegal Signs Removed.

The article below is from the *Santa Barbara Press*:

Santa Barbara County's scenic roadsides are being partly cleaned of signboards by the district state highway maintenance crew, it was announced yesterday from the office of the County Planning Commission. Similar work is being done in other counties.

During the past few weeks thousands of signs in this county and in San Luis Obispo and Ventura counties have been taken down by the county and State road crews. Only those signs placed on ranch properties without the permission of the owners are removed. Work is concentrated on scenic sections of highway. Signs are encouraged in commercial districts.

Santa Barbara County, while relatively clean of billboards and signs, is occasionally flooded with signs, County Planning Director L. Deming Tilton said. The county crews are watching the roadsides carefully to keep the signs at a minimum in scenic sections.

Toll Bridge Purchase Praised.

The following editorial is from the *Riverside Press*:

It is good news that the states of California and Arizona have reached an agreement with the owners of the Blythe-Ehrenberg bridge for the purchase of that structure. * * *

Governor Rolph is entitled to great credit for working out this arrangement with Arizona. The achievement is one that does credit to his tact and ability to handle such a difficult problem which has been created by the antagonism toward California that has in the past existed on the part of Governor Hunt of Arizona.

Highway Commissioner Tetley of Riverside has also rendered valuable service in the matter.

Rolph Administration Vindicated.

Apropos of the above, the following editorial is from the *Redlands Facts*:

California and Arizona appear to be working toward a common purpose at last. The important incident is common purchase of the Blythe bridge that the highways connecting the two states may be taken into the Federal aid system. Governor Rolph, if he makes friendly relationship with Arizona, will have vindicated his administration at the start. The non-sense of ill feeling between the states has existed long enough, and has had a great deal to do with the persistent bitterness concerning the proposed Boulder Canyon development.

Right to the Point.

Very pertinent comment by the *Tulare Times*:

California is spending millions to do away with grade crossings. A nearby example of the huge expenditures made for this purpose will soon take place here, when the Highway Commission builds eight miles of new road to obviate two railroad crossings. With safety first as a motto, the State is expending vast sums for the protection of the careless driver. The State seems to think more about the lives of the heedless drivers than they do themselves, which of course is the right policy.

Benefit of Roadside Burning.

The following testimony of the benefit of roadside burning is given by the *Colton Courier*:

Although many of us have doubtless at various times questioned the advisability of expending money in removing the weeds from along the highways, there are figures to prove that the expenditure of money for that form of public improvement has been more than repaid in the saving of property through elimination of roadside fires.

An example of this saving is shown right here in our own county where there was formerly one fire to every ten miles of highway through grass land and brush each year. After roadside clearing had been established the fires were lessened and last year there was not a single roadside fire in the entire county where the highway had been properly cleared, irrespective of the amount of travel over many sections of the popular roadways into the mountains.

Good Road for Hot Dog Stands.

Says the *Chico Enterprise*:

The reaction of R. A. Sherwood of Chico to the aspersions of Jo Boucher and N. D. Bruce of Paradise to the effect that the Deer Creek road, as depicted in a map of northern California highways and proposed highways in Wednesday's *Enterprise* is a bologna road, is that nothing links up like a sausage.

* * * * *

Highway Policy Commended.

The *Modesto News-Herald* makes the following editorial comment:

The State Senate Committee on Roads and Highways has voted to stick to the policy of providing money only for those roads that are included in the budget prepared by the State Highway Commission.

That is the wise and sensible thing to do.

For this budget is prepared after a thorough and impartial study of the whole situation by the engineers of the Department of Public Works. It seeks to be fair to all sections; and at the same time include only such improvements as there is money in sight to pay for.

If exceptions are made to its recommendations, the bars will be down and the highway system again will become a legislative football and pork barrel.

* * * * *

Getting To Be a Habit.

The *Pacific Palisades* tells the following story:

Last Friday afternoon a rock truck belonging to the State Highway Maintenance Department, operated by Arthur C. Humphrey, went over the bank near Castellammare, severely bruising the driver about the face and shoulder, and in'uring his ribs.

Humphrey was unloading rock along the beach. The tongs held on to a heavy rock and before it could be released pulled the truck over the bank, Humphrey going down with it. He was taken to a doctor in Santa Monica by Frank Fay, the actor, who happened to be passing at the time, and later was moved to his home.

This is the sixth time Humphrey has had an experience of this kind, and each time it has happened on a Friday.

* * * * *

Commissioner Hopkins Wins Warm Praise.

This is from the *Tehachapi News* of March 20th:

The Tehachapi Highway—and we can now say that, with much pride—has an able champion in State Highway Commissioner Harry A. Hopkins of Taft. One of the first things Mr. Hopkins did on taking his seat on the Commission was to make himself vigorously heard in favor of this main artery and which has been fought through two administrations. The Commission unanimously endorsed the Edwards bill, Chairman Earl Lee Kelly declaring: "The roads in the rural sections of the State must be developed both to take

Dam Supervision by State is Commended

THE leading article in the January number of *Pacific Service Magazine* is a resume on State supervision of dams by A. H. Markwart, vice president of the Pacific Gas and Electric Company. We quote in part from this article as follows:

The failure of the St. Francis dam focused the attention of the State legislative body on the necessity for concentrating the supervision of dams under one central control. As a result, the 1929 Legislature, under the police powers of the State and for the purpose of safeguarding life and property, invested the duty of the supervision of the construction and maintenance of all dams, with the exception of those owned by the United States, in the Department of Public Works, under the administration of the State Engineer. This law repealed all other State acts governing the supervision of dams.

The new California law states that all dams in the State, whether heretofore or hereafter built or then under construction, shall be under the jurisdiction of the Department of Public Works, as administered by the State Engineer, and that it shall be unlawful to construct, enlarge, repair, alter, remove, maintain or operate any dam except with the approval of that department. All dams fifteen or more feet in height from the stream bed to the crest of the spillway, or impounding ten acre-feet or more, are subject to this control.

* * * * *

In the administration of the duties conferred upon the State Engineer by the new legislation, a fine spirit of cooperation has been evidenced at all times. Dam construction has been termed "a splendid adventure," and true it is, for unforeseen and difficult conditions arise and alteration in the original plans and decisions must be made with the least possible hindrance of the work. Such situations, as they arise, require the fullest cooperation among all parties involved. In this the State representatives have been most helpful, and have shown their understanding of their duty which, under the police power of the State, is primarily to see that public safety is assured.

care of their own and traffic needs, and also to provide transportation facilities in and out of the metropolitan centers. Governor Rolph expressed this thought in his very able inaugural address."

* * * * *

An Improved "Unimproved" Highway.

Under the heading Technically Unimproved, the *Marysville Democrat* comments as follows:

Although the Tahoe-Ukiah Highway between Marysville and Grass Valley is labeled on the latest map of the State Department of Public Works as "unimproved," the motorists who have been using it for years are of the opinion that it is vastly improved since the State took charge of it.

The designation on the map is meant only to differentiate between that type of improvement and other types in use by the State. The entire section between Marysville and Grass Valley has been improved by regrading, widening, change of alignment, removal of

(Continued on next page.)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
GEORGE C. MANSFIELD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 APRIL, 1931 No. 4

Law Is Cited of Responsibility for Children Motorists

THE California Highway Patrol calls the attention of the motoring public to provisions of the law setting up the method whereby parents and others who have signed the application of a minor for an operator's license may be released from the liability they have assumed.

The Division of Motor Vehicles, it was stated, can not under the law accept an application for release from liability unless the application has been verified and properly notarized as required by law.

Persons seeking to file such release applications were advised to secure from the nearest branch office of the patrol a correct form which has been devised. These forms are now available at all branch offices of the Division and the patrol.

Under the present law no minor may obtain an operator's license unless the application is signed by both parents, if both are living, or by his guardian, employer or other person having custody of the minor. The person or persons signing the application then become liable for damages caused by the minor as a result of negligence. The only exception is when the minor is driving a vehicle as the agent of someone other than the person signing the application.

In cases in which the person signing the application of a minor makes formal request for release from liability the law requires the Division of Motor Vehicles to cancel the license.

AN IMPROVED "UNIMPROVED" HIGHWAY

(Continued from page 18.)

stones and resurfacing, yet this is not sufficient to constitute improvement as rated by the State. Formerly rough, narrow and unsurfaced, the highway easterly from Marysville is now smooth, wide and oil surfaced, with the exception of four miles that will be rebuilt this year. It is now a highly popular route into the hills and mountains, and is part of an excellent scenic loop out of Sacramento.

"Boy, whab did yon say you got wounded? In what battle?"

"In de Doggone Forest," promptly replied Rastus.

"You mean the Argonne?" someone asked.

"Well," said he, "maybe they are gone now, but they wuz there then."

"NOT AN UGLY HIGHWAY IN CALIFORNIA"

(Continued from page 2.)

Whatever the individual opinion of the reader may be, relative to billboard advertising, certainly there can be no great difference of opinion as to the need for eliminating any ill-placed signs from areas fronting on highways. This statement is made not alone with regard to the billboards erected by the larger out of door advertising concerns, but is also directed against the motley and discordant array of signs with which many local merchants litter up the landscape along the highways leading into their cities. These signs have no advertising value to the merchant, but serve only to create the impression upon travel that the particular town in which these merchants may live holds beauty in little regard.

ROADSIDE BUILDINGS

Again a highway lined with ugly, untidily planned and unattractive buildings can never be a beautiful highway. Nor is there any excuse for any such structures here, for in California the flowers, the shrubs and the trees of the whole world are available for planting. Beauty here need not cost money. It can be literally had without money and without price. It need only be desired.

AN ADMINISTRATION AMBITION

My ambition for the present highway administration is a longer program of highway beautification. Our slogan should be, "Not an Ugly Highway in California." I know of no greater contribution than this that the administration of Governor Rohph can make to the State highway system of California. It fits into the spirit of his administration. It fits into the spirit of California.

While Mark Twain was editor of a Missouri paper, a subscriber wrote to him saying he had found a spider in his paper and asked Mark whether this was a sign of good or bad luck. The following was the reply of the humorist:

"Old Subscriber: Finding a spider in your paper was neither good nor bad luck for you. The spider was merely looking over our paper to see which merchant is not advertising, so that he can go to that store, spin his web across the door and lead a life of undisturbed peace ever afterward."

The little son of a minister had been very naughty and as punishment he was not allowed to eat with the rest of the family, and a small table was set aside for him. On being given his food at this table for the first time, the little chap said very solemnly: "Lord, I thank Thee. Thou hast spread a table before me in the presence of mine enemies."

GOVERNOR ROLPH SIGNS BILLS PROVIDING ORDERLY ADDI- TIONS TO STATE HIGHWAYS

(Continued from page 6.)

H.—An extension of State Highway Route 61 from Red Box to a connection with State Highway Route 62 near Big Pine Flat; 37 miles: Los Angeles County.

This is strictly a recreational project proposed at this time because the demand for such highways within a short distance of the enormous population centered in Los Angeles County and vicinity is insistent. In this section of the south, the desire of tourists and of valley residents to make the most of every opportunity to spend leisure on recreational drives has resulted in phenomenal use of road facilities that provide such pleasure. Large local expenditures are annually made to extend the ways into the mountains. The timbered areas are few and water supply is limited. Where these are both available the incentive to reach them is strong. Their development approaches, in the south, a necessity rather than a luxury, even in face of the extreme costs of road building in these southern mountains.

Pressure for access to the cool and scenic mountain heights at the heads of the Arroyo Seco and the San Gabriel rivers accomplished inclusion in the state highway system of route 61 and route 62. The same urge initiates the present proposal to extend along the mountains a connection between these routes. It qualifies as a road which will carry such state classified traffic, as a relief for congested state roads of like nature, and as a necessary addition to justify expenditures on State Route 61.

I.—A highway from Los Angeles to a connection with State Highway Route 26, east of Colton; 42.5 miles: Los Angeles and San Bernardino counties.

In the confined territory east and southeast of Los Angeles, that widens as it approaches San Bernardino and Riverside, the nature of local arteries has broadened in function and of necessity has resolved into several principal routings to Los Angeles from individual centers east thereof: the routes near the coast, the Foothill boulevard at the base of the mountain range, and, between these, more direct passages. This route is one of the intermediate routes following in large part county roads that are ideally located. It leaves Los Angeles midway between two congested

arteries—Whittier boulevard and the Foothill boulevard—utilizes Garvey and Holt avenues through developed territory where radical changes in location would incur prohibitive right of way costs and connects with State Highway Route 26 near Colton.

The route qualifies on large present volume of state traffic carried, on relief to other state roads and as a link in interstate routing.

J.—A highway from the southern terminus of State Highway Route 43 to Newport Beach via the Santa Ana Canyon; 63 miles: San Bernardino, Riverside and Orange counties.

A line from San Bernardino to the coast through the cities lying northeast and southwest of the Santa Ana Mountains practically makes a right angle with the coast line at Newport Beach, and is, therefore, the most direct line to the coast through an area that includes Colton, Riverside, Corona, Santa Ana and Orange. This line closely follows the course of the Santa Ana River, which breaks a pass through the Santa Ana Mountains and the Puente Hills and provides the only practicable highway location along the direct line mentioned. All other main routes cross it at right angles.

This artery is well fed by local, intercommunity and intercounty traffic. Additional traffic in large quantity is of a recreational nature, those from the coast towns seeking the mountains through San Bernardino, Redlands and Riverside, and those from the interior valley making their way to the coast. By this attractive route traffic between termini or subtermini will avoid the inconvenience and congestion of longer and busier thoroughfares to the west. With the astonishingly rapid development in this area both to date and expected in the future, the routing is essential if the state is to render adequate service, protect a large initial outlay, and economize by taking advantage of the present opportunity to establish permanent routing.

The route qualifies for inclusion in the state system because it now carries a large volume of state traffic. It will form a logical unit of the state system covering this section without being supplanted by parallel service of equal value.

K.—A highway from Riverside to Beaumont; 19.5 miles: Riverside County.

The county highway between Riverside and Beaumont, commonly referred to as the Jack-rabbit Trail, is used by many as a by-pass of State Highway Route 26 in breaking across country between points east of the former city and west or south of the latter. From Beaumont but a small rise is required to the

pass in the San Jacinto Range from which the road descends to the San Jacinto Valley and through the Alessandro Valley to a junction with the Inland route. Realignment of portions will bring this route to a high standard. It would then be equal to State Route 26 in distance between Beaumont and Los Angeles points, be shorter for traffic between Beaumont and Riverside or points southwest thereof, have no interference through contact with cities en route, and be of decided advantage to commercial vehicles trucking westerly from points east of Beaumont (including the Imperial Valley) since the appreciable grades descend in a westerly direction.

It will make advantageous connections westerly through Riverside with State Highway Route 19 and the route through Pomona to Los Angeles; southwesterly with the proposed state highway through Santa Ana Canyon and to the beaches; southerly with the Inland route, Riverside to San Diego; and easterly through State Highway Route 26 to the Imperial Valley and transcontinental highways. From Beaumont easterly to the Imperial Valley is a source of supply for truck and farm produce which the Los Angeles area will absorb as fast as it can be supplied. Colorado River prospective water supply projects will create on this route a volume of new traffic of a State and intercounty character.

This route, now so well patronized as an alternative of State Route 26 even though its standards are relatively low, will continue to induce traffic. Since the majority of that traffic is intrastate in character, the volume is considerable and a relief to route 26 would be economically furnished, the route qualifies for State inclusion. By-passing the Redlands and San Bernardino highway by deflecting the trucking element over this more advantageous routing is an economic policy.

L.—A highway from Riverside to San Diego; 95 miles: Riverside and San Diego counties.

The Inland route from Riverside to San Diego is an old established county routing which passes through many settlements and towns in plains and in narrow valleys lying in a semimountainous district between the aforesaid termini. Riverside and San Diego counties have paved this route in the past, making a serviceable road for light traffic. For increased volume and speed much of the alignment is too sharp. The length of ultimate State routing from Riverside to San Diego termini would be 20 miles shorter than the existing highway.

The Inland route offers the most direct passage for traffic to and from San Diego which would lead through Riverside and any of the territory north of that city or northwest as far as Ontario, all of which is or will be coordinated by direct State highways. Resorts and attractive country en route induce a recreational traffic. It can, therefore, be classified as important for a link in the State system. Without its inclusion a county highway must assume service of a State nature, service not supplied by direct routing on the State system.

It qualifies for State inclusion by volume of intercounty and intrastate traffic it now carries, by reason of relief it will afford to present heavily traveled State roads and as an advantageous component of a comprehensive State system.

M.—A highway from Pomona to Temecula; 56 miles: Los Angeles and Riverside counties.

A valuable adjunct in state road systemization would be a short cut to the Elsinore Lake district and to the Inland route from the territory between Corona and Pomona and the territory north and west of Pomona. It would prove a convenient approach to the Inland route for the Los Angeles and Pasadena vicinity. From extreme points in Los Angeles it offers an alternative passage to San Diego which, though longer than the coast route, will avoid restrictions to speed on the coast route, caused by congestion and delays within more numerous cities.

The general course of the proposed route is very direct from the western terminus near Pomona to the Santa Ana Canyon near Prado and through Temescal Canyon to Lake Elsinore and to Temecula on the Inland route. Correct location for an economical direct highway will be possible if defined before it becomes prohibitively encumbered by improvements en route. The most favorable of existing road facilities could be utilized.

On the basis of expected increase on improved routing, on the normal increase of local development, on the value this route would give as an inland passage from eastern Los Angeles vicinity to San Diego, and on its recreational value, it is estimated the route will, by 1940, carry 6450 vehicles on Sundays and 3100 vehicles on week days, these being average twenty-four-hour daily estimates.

It qualifies for State inclusion on road systemization, on relief to the Coast route and on present and probable future volume of State traffic thereon.

N.—A highway (a) from Blythe to the California-Arizona State line at the Colorado River and (b) from State Highway Route 26 near Indio to a connection with State Highway Route 64; (a) 4 miles; (b) 19.5 miles: Riverside County.

State Highway Route 64, made a State highway by constitutional amendment, 1919, does not connect with a State highway, at Mecca on the west and terminates on the east at Blythe, 4 miles from the State line. As a link in transeontinental routing, the State route should extend from the State line to a junction with some other State route. Proposed for inclusion in the State system are the two sections which will rectify deficiency in present designation of routing and will complete the route for proper termini connections.

Approval of the requests of Arizona and California to place this route on the federal aid system has been granted by the Secretary of Agriculture. Designation of a unit with connections to the State line and to another established route in California is essential. The proposal qualifies for State inclusion as a necessity on interstate connection.

O.—A highway from National City to the United States-Mexico international boundary near Tia Juana; 10 miles: San Diego County.

There is no State highway south of San Diego to the International Boundary. San Diego and the contiguous municipality, National City, extend city limits to within 10 miles of Mexico, said 10 miles being traversed by county highways.

The recommended location would utilize portion of county road with an ultimate connection to the Mexican line that depends upon the final site for the U. S. Customs House, as yet undecided.

The routing will carry a large volume of local traffic but when the proportion of such which can be analyzed as of a transient nature is added to the number which originate at distant points we find that this routing serves principally a class of traffic of State rather than local nature.

Present traffic is sufficient to justify a first class highway and State control of same. The international connection on the Pacific coast should be a State highway. The road down the Mexican coast extends far and will undoubtedly be continued farther. The road is classified for inclusion on volume of State traffic and as an international road connection of importance.

P.—A highway from Calexico to State Highway Route 27 near El Centro; 8.5 miles: Imperial County.

between State Highway Route 27 near El Centro and Calexico on the Mexican border. Its northern terminus is near the junction of the three State highways, routes 12, 26 and 27, in the center of the intensely cultivated irrigation district of the Imperial Valley that contains the large towns of the southeast portion of the State. The southern terminus is the only important entrance from California to Mexico east of the Pacific coast. The proposed route accordingly provides direct contact for all the highways that converge in this vicinity and for all the community, development and international interests centered at this point.

This project qualifies upon its classification of international highway connection. It coordinates the present State highway system with such a connection and with highway development proposed by the county through the heart of Imperial County.

Q.—A connection from State Highway Route 63 to the California-Nevada State Line; 2½ miles: Mono County.

Oasis is the eastern terminus of State Highway Route 63. A 2½-mile gap over Fish Lake Valley intervenes between Oasis and the California-Nevada state line, where Nevada state highway proceeds northeasterly. Inclusion of this short section as a State highway will close the gap between the California and Nevada highway systems, will afford a complete interstate connection and correct an obvious error in State highway designation.

R.—A highway from Castaic Junction to a connection with State Highway Route 2 near Ventura; 39.5 miles: Los Angeles and Ventura counties.

A well traveled county highway follows the Santa Clara River drainage from State Highway Route 4 near Castaic Junction to State Highway Route 2 near Ventura. It furnishes service for the following traffic: (a) Local traffic originating along its route, comprising considerable intercourse between Ventura, Santa Paula, Fillmore and Piru and including the trucking and domestic movement from many ranches and orchards in this river valley. (b) Intercounty traffic from points along the coast between Santa Barbara and Ventura vicinities to points in the northwest part of Los Angeles County. (c) State-wide traffic whereby the best facility is offered by this route for those from or to the Coast route near Ventura to or from the State Highway over the Tejon Pass into the south San Joaquin Valley and to or from the State Route 23 northeast of Castaic. Because of the absence of appreciable grades thereon and because it

The proposed road for State inclusion is

avoids congestion on routes closer to Los Angeles, the route is taken by many who leave the coast near Ventura for San Fernando Valley and points easterly via State Highway Route 9, the Foothill boulevard through Pasadena, San Bernardino, etc. Improvement of this route to eliminate sharp unnecessary turns and hazardous rail crossings, and to provide satisfactory width and type of pavement would greatly increase through travel thereon. By 1940, traffic of 7000 and 5000 vehicles for 24 hours on Sundays and week days, respectively, would be a conservative estimate.

It qualifies for State inclusion on importance and volume of State traffic now using it and is relief for alternative State routes.

S.—A highway from State Highway Route 31 near old Cajon Station to a connection with State Highway Route 23 near Lancaster; 49 miles: Los Angeles and San Bernardino counties.

The above route is a proposal effecting a short cut from San Bernardino to the San Joaquin Valley or to the east Sierra route through Owens Valley to Tahoe and Nevada. The proposed location continues the northwesterly direction of the San Bernardino-Cajon portion of State Highway Route 31, passing over the Cajon Range through Phelan Pass and proceeding to Lancaster over level country, the whole coordinated route making a straight course which will justify it as an essential through route. Traffic on existing indirect and unimproved desert mountain roads is not representative of volume that the proposed route will carry.

Through its northern terminus it will derive traffic from State Highway Route 59, State Highway Route 23 and the Tehachapi Pass road, as well as from the fertile vicinity of Lancaster. Through San Bernardino a large adjacent area will contribute traffic, with the Inland route forming a direct passage from territory to the south and State Highway Route 26 supplying the approach from the Imperial Valley and Arizona.

This route qualifies as a favorable alternative in relief of present state routing and as an important coordinating link in the state highway system to serve the potential traffic demand at or through San Bernardino.

T.—A highway from Pomona to State Highway Route 2 near Fullerton via Brea Canyon; 15.5 miles: Los Angeles and Orange counties.

The county highway running from Pomona to Fullerton by way of Brea Canyon, a cross-connection between the inland territory surrounding Pomona and the coast territory south of Los Angeles, bears the same relation to

this vicinity as the Santa Ana Canyon route bears to the San Bernardino-Newport Beach travel. It and the Santa Ana Canyon road utilize the two available locations through the ridges separating the coast and the interior and satisfy traffic desire common to Los Angeles, Orange, Riverside and San Bernardino counties.

The Brea Canyon road joins State Highway Route 19 and State Highway Route 2 by a lateral at right angles to the course of those routes. It is geographically located about equidistant between the Santa Ana Canyon lateral and the thoroughfares to the coast on the southeastern outskirts of Los Angeles. Its course is in the proper direction for direct routing from origin to destination of traffic not as conveniently served by alternative highway facilities.

Brea Canyon will attract more traffic as the local streets and boulevards nearer Los Angeles become more crowded. It and the Santa Ana Canyon road are the two laterals southeast of Los Angeles that must carry cross traffic inland from coast, a state function not now supplied by the present state system. It qualifies as a highway now by carrying a large volume of state traffic.

U.—A highway from San Luis Obispo to a connection with State Highway Route 56 near Cambria; 36 miles: San Luis Obispo County.

At present State Route 56, from Carmel south along the coast, terminates state jurisdiction near Cambria. San Luis Obispo County highway connects it to State Highway Route 2 at San Luis Obispo. The classification of traffic on this section will change from strictly local traffic to a cosmopolitan nature when the completion of the state coast highway provides the through drive.

The Cambria-San Luis Obispo proposal qualifies for state inclusion as a unit extending to a connection with the existing system a state highway that will carry a large proportion of state traffic. It is one step toward effecting this general policy by a secondary road inclusion in the south where mileage is not in balance with the remainder of the state.

V.—A highway from Santa Barbara to a point on State Highway Route 2 near Zaca, via San Marcos Pass; 38 miles: Santa Barbara County.

State Highway Route 2 follows the coast for 30 miles west of Santa Barbara, then turns north for 18 miles to Zaca, passing through Gaviota Canyon. This proposed additional route is a diagonal of these two courses, is 10 miles shorter and lies on the direct line from Santa Barbara to Santa Maria.

The proposed route qualifies as a measure for relief to State Highway Route 2, supplying a shorter alternative that is also a scenic and recreational routing. It will indefinitely postpone radical widening of the present state highway through Gaviota Canyon and along the coast which would destroy valuable landscape and property. It coordinates with future road development north and south of its termini.

W.—State Highway Route 14, near Crockett, to American Canyon Route, near Vallejo.

This route will provide a connection from the proposed American Canyon Route to State Highway Route 14, near Crockett. It will provide a complete through road for traffic from the inland valleys to the bay area.

HIGHWAY PATROL COURTESY COLUMN

(Continued from page 12.)

Parking Made Easy For Convention.

Mrs. E. H. Brown, Durham: On February 28th, the Durham Women's Home Department entertained the Home Department from all over Butte County, 500 women attending. Mr. T. C. Bissett, Chico traffic officer, had charge of the parking. The school in which we entertained was on the highway. It was dangerous for women drivers to turn off and park. He took care of 130 cars. There was no confusion or jamming of cars coming or going. The women of the various Home Departments thought they were very fortunate in having such a capable and efficient traffic officer.

The Pruitts had the reputation of being the world's ideally married couple, so on their silver anniversary friends gathered and in the course of the evening asked Mrs. Pruitt how it happened that she and her husband never quarreled.

"It's because we understand each other so perfectly," she beamed. "If we have a difference of opinion and I am right, Chauncey gives in at once."

"And if it is he who is in the right?"

The lady drew herself up. "In our twenty-five years of married life," she declared, "that's never happened."

A curious little boy was watching a car being loaded at the station, and later inquired: "Why do they call it a shipment when it goes in a car and a cargo when it goes in a ship?"

Old Lady (to street-car motorman): "Please, Mr. Motorman, will I get a shock if I step on the track?"

Motorman: "No, lady. Not unless you put your other foot on the trolley wire."

Mrs. Blabber: "You're looking very happy this morning. Had you had good news?"

Mrs. Gabber: "Just wonderful! My husband has just had a nervous breakdown and we're going to California."

APRIL BULLETIN OF SNOW SURVEY AND PRECIPITATION DATA; SEASONAL FORECAST

(Continued from page 7.)

for the actual seasonal stream flow of 1924 (a record dry year) as follows:

Stream	Seasonal stream flow in per cent of 40-year mean (1889-1929)	
	Estimated	Actual
	1931	1924
Sacramento River at Red Bluff	35	36
Feather River at Oroville	27	25
Yuba River at Smartsville	35	23
American River at Fair Oaks	30	18
Sacramento River at Sacramento (Including tributaries)	33	30
Mokelumne River at Clements	32	22
Stanislaus River at Knights Ferry	35	19
Tuolumne River at Jacksonville	40	28
Merced River at Exchequer	38	23
San Joaquin River at Friant	30	22
San Joaquin River near Vernalis (Including tributaries)	36	24
Combined Sacramento and San Joaquin Rivers (Including tributaries)	33	28
Kings River at Piedra	25	21
Kaweah River at Three Rivers	28	22
Kern River near Bakersfield	32	28
Combined Kings, Kaweah, and Kern Rivers	28	23

Based upon past experience these estimated seasonal stream flow percentages are used to predict the minimum stream flow to be expected at certain points and these estimated minimum flows are compared with the actual minimum flows of 1924, as follows (The estimates assume a 1931 rice area approximately 10 per cent greater than that of 1930—preliminary data):

Stream	Minimum flow in second-feet		Flow Date
	Estimated	Actual	
	1931	1924	
Sacramento River at Red Bluff	2800	2810	July 6
Sacramento River at Colusa	1100	1470	July 21
Sacramento River at Sacramento	1000	705	July 17
Feather River at Nicolaus	50	0	Aug. 2
American River at Sacramento	40	0	Aug. 1
San Joaquin River near Vernalis	500	391	July 22
Combined Sacramento and San Joaquin River flow to Delta, minimum 10 day flow	1600	1280	July 10 to 19, Incl.

Based upon the relation established by past records, the estimated seasonal stream flow percentages and minimum flows are applied to predict the maximum salinity to be expected in the late summer at points in the Sacramento-San Joaquin Delta and comparison is made with the 1924 salinity records, as follows:

Delta Stations	Maximum salinity (high tide) in parts of chlorine per 100,000 parts of water		Date
	Estimated	Actual	
	1931	1924	
O and A Ferry	1250	1345	August 28
Collinsville	1050	1150	August 16
Antioch	930	1080	August 20
Emmaton	670	802	August 6
Jersey	580	708	August 30
Three Mile Slough	530	692	August 30
Rio Vista	400	608	August 12

Winter Traffic Count on State Highways

By T. H. DENNIS, Maintenance Engineer

THE REGULAR winter traffic count on State highways was taken on Sunday and Monday, January 11 and 12. This is the seventh winter count taken over the highway system. In previous years the count was made from 6 a.m. to 10 p.m. The 1931 count, however, was reduced to four hours each day, and traffic for 16 hours estimated for comparative purposes with the year 1929 as a basis. The 1929 count was selected as a basis for expanding the 4-hour counts to 16 hours because traffic during the 1930 count was generally disrupted by inclement weather and was far below normal. In making a comparison of the detailed figures which follow for 1930 and 1931 this fact must be borne in mind.

The 1931 Sunday count covered the hours from 10 a.m. to 2 p.m. The Monday count included the peak hours of travel from 8 a.m. to 10 a.m. and from 4 p.m. to 6 p.m.

The large volume of purely recreational Sunday travel, which is most pronounced in densely populated areas, precludes the use of a state-wide average for making a 16-hour estimate of traffic from 4-hour counts. On the other hand, the flow of traffic on Monday is more regular and a single average would be fairly representative. The averages obtained from the 1929 count and used in estimating the 16-hour counts for 1931 are as shown below:

Percentage Which 4-Hour Count Bears to 16-Hour Count										
DISTRICT	I	II	III	IV	V	VI	VII	VIII	IX	X
Sunday—										
10 a.m. to 2 p.m.	31	31	27	26	28	30	27	28	31	27
Monday—										
8 a.m. to 10 a.m.	31	31	32	31	30	31	30	30	31	30
4 p.m. to 6 p.m.	31	31	32	31	30	31	30	30	31	30

The hourly variation of traffic is erratic at stations registering less than 200 vehicles in 16 hours, and the 1931 estimate appears to be exaggerated at some of these stations. Excluding such cases the estimate for a majority of the stations is believed to be within a range of 10 per cent, while practically all stations fall within a range of 20 per cent. For ordinary applications this variation is not a serious matter especially for the winter count which covers, usually, the minimum traffic period of the year.

In comparing the detailed counts at the 889 stations which follow it should be noted that traffic for 1930 was below normal and the figures for 1931 therefore appear to be excep-

tionally high. If allowance is made for the fact that the 1930 Sunday traffic showed a decrease of 36.2 per cent from the 1929 figure, and the Monday traffic a decrease of 14.5 per cent, such variations will be less pronounced. Any general statement showing annual increase as a whole or by State routes and based on the 1930 count would be misleading, and has therefore been omitted from the summary.

The station by station record is as follows:

Route 1. Sausalito to Oregon Line				
District IV				
Station location	January, 1930 Sun. 12	Mon. 13	January, 1931 Sun. 11	Mon. 12
Sausalito to Ferry Building.....			57	50
Sausalito-Hyde Street Ferry.....			5,119	2,166
Hyde Street-Berkeley.....			4,112	2,735
Belvedere Jc. R. 52 to Belvedere, S. on 1.....	4,562	2,850	5,800	3,100
E. on 1.....	761	142	5,111	3,791
N. to Corte Madera.....	4,293	2,602	2,300	1,200
Alto Jc. at Jc. Marin 1-C & Rt. 52 S. on 1.....			5,800	3,200
E. on 52.....			900	470
N. on 1.....			5,500	3,100
Calit. Park Y. Jc. Rt. 1 & 69, S. on 1.....			6,400	2,600
E. on 1.....			8,600	3,700
E. on 69.....			3,200	1,100
San Rafael N. of Cy. at Hill Top.....	3,594	2,812	5,900	3,100
Petaluma S. of Cy. Limits at Maint. Yard.....	2,200	1,965	4,600	2,900
Petaluma N. of Cy.....	3,833	4,463	5,700	4,300
Cotati at Jc. C.R. to Sebastopol, W. on C.R.....	2,359	2,935	1,300	1,000
N. on 1.....	632	512	1,100	730
Santa Rosa S. of Cy. at Triangle Service Sta.....	1,807	1,575	2,200	1,100
Santa Rosa N. of Cy. at S. P. R. R. Xing.....	2,390	2,078	3,400	2,300
Healdsburg S. of Cy. at N. W. P. R. R. R. Xing.....	2,894	2,389	3,700	3,500
McCrays Jc. C.R. to Preston, S. on 1.....	1,915	1,400	2,100	1,500
E. on C.R.....	815	615	1,100	570
N. on 1.....	160	154	320	180
McDonald at Jc. Rt. 48 to Booneville, S. on 1.....	656	495	820	400
W. on 1.....	541	422	840	380
W. on 48.....	168	122	220	90
N. on 1.....	379	304	620	300
Hopland at Jc. Rt. 16 to Lakeport, S. on 1.....	449	631	980	690
E. on 16.....	405	362	610	390
N. on 1.....	834	981	1,500	1,000
Ukiah S. of Cy. Lts. Jc. with Rt. 70, S. on 1.....	804	712	1,300	830
E. on 70.....	529	651	670	680
N. on 1.....	1,176	1,283	1,800	1,400
Ukiah N. of Cy. Lts. Jc. Rt. 15 to Colusa, S. on 1.....				
E. on 15.....	1,042	753	1,500	1,100
N. on 1.....	377	311	570	420
	752	490	1,400	770
District I				
Willits N. of Cy. at Jc. C.R. to Sherwood, S. on 1.....	453	367	650	650
W. on C.R.....	64	23	60	50
N. on 1.....	394	342	590	706
Mendocino-Hum. Co. Line, Garberville Jc. C.R. to Briceiland, S. on 1.....	196	115	240	180
W. on C.R.....	288	259	640	390
S. on 1.....	73	77	190	140
N. on 1.....	330	320	700	480

(Continued on page 36.)

Newcastle Tunnel Project Is About One-third Complete



West portal of tunnel under Newcastle

THE Newcastle cut-off construction, consisting of a tunnel under the Southern Pacific Railroad and the north part of Newcastle and new grading and surfacing of the cut-offs from the present highway to the tunnel, which is under contract to T. M. Morgan Paving Company, is one-third completed. Driving of the tunnel is under way, construction of drainage units and reconstruction of public utilities are in progress, and grading of the new roadbed is being done as rapidly as the preliminary work connected therewith is completed.

HIGHWAY CREW AID IN FIGHTING FIRE PRAISED

COMMENDATION of representatives of the Division of Highways is voiced in the two letters printed below for co-operation in subduing a fire in the Arroyo Seco, Los Angeles County, extended by Maintenance Foreman Fred Phillips and Gray H. Cuttriss, and aid given by a highway crew dispatched by Resident Engineer A. N. George. The letters follow:

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE, ANGELES NATIONAL FOREST

Los Angeles, California,
March 20, 1931

Mr. S. V. Cortelyou,
Division of Highways,
Los Angeles, California.

Dear Sir:

On March 11th a fire occurred in the Arroyo Seco in one of the cabins there and the fire truck in the Arroyo Seco was dispatched to the scene and, incidentally, Fred Phillips and Doc Cuttriss, who were working

close to the warehouse at the time joined our truck crew and went to the fire, working from 11.00 a.m. to 1.00 p.m. Mr. A. N. George also dispatched a crew of 10 men who worked for one hour.

This sort of cooperation, Mr. Cortelyou, is just the kind that makes it possible for the Forest Service to maintain somewhere near an adequate fire protection record, and I wish to take this opportunity to thank you for the attitude your men have in connection with this important work, and would like to have you convey my sentiments to the men who reported for work and assisted in this particular job. This type of cooperation is appreciated by every member of the Forest Service organization and goes beyond the kind of cooperation we hear so much about that is more or less inactive when an actual fire occurs.

Very truly yours,

WM. V. MENDENHALL,
Forest Supervisor.

THE GIRLS' CORNER CLUB
Frances L. Neth, Director
Los Angeles, Calif.

March 16, 1931.

Mr. S. V. Cortelyou,
Division of Highways,
Dept. of Public Works,
Los Angeles, California.

My dear Mr. Cortelyou:

The Girls' Corner Club Cottage located in the Arroyo Seco, known as Camp No. 200, was practically destroyed by fire March 11, 1931. I am taking this occasion to thank you for the valiant and faithful work that was done at that time by your men, Mr. F. V. Phillips and Mr. Gray H. Cuttriss. They worked unceasingly to attempt to save our building and contents, and we appreciate in the deepest way their unselfish efforts for us. They have been such kind, neighborly friends to us, courteous and thoughtful in every way that hence I am writing this note to you.

We regret that the main building was almost entirely destroyed, but we are planning to rebuild immediately.

Again, with many thanks, I am,

Most sincerely yours,

FRANCES L. NETH.

LETTER OF APPRECIATION

The following letter of appreciation was written by District Engineer Cortelyou to the men mentioned in the above letters:

Los Angeles, Calif.
March 23, 1931.

Mr. A. N. George
Mr. F. V. Phillips
Mr. Gray H. Cuttriss
Pasadena, Calif.

Gentlemen:

I am sending to you herewith copies of letters dated March 20th from Wm. V. Mendenhall, Forest Supervisor, and dated March 16th from Frances L. Neth, Director of the Girls' Corner Club, expressing appreciation of your help in fighting a fire in the Arroyo Seco on March 11th.

In your action on that day you have exemplified the spirit of cooperation which we wish to have permeate our organization, and I desire to commend you for your efforts along this line.

Yours very truly,

S. V. CORTELYOU,
District Engineer.

Progress Report of Activities

in the

Division of Water Resources

AS OF MARCH 1, 1931

EDWARD HYATT, Chief of Division

Irrigation District
Activities



Applications for
Approval of
Dams

Flood Control and
Reclamation



Adjudications
of Stream
Flow

IRRIGATION, WATER STORAGE DISTRICTS

The spring meeting of the California Irrigation Districts Association was held in Sacramento on February 27 and 28, 1931. The meeting was devoted to the discussion of proposed legislation affecting irrigation districts and the irrigation interests of the State. Mr. William Durbrow was reelected president and Mr. W. D. Wagner, secretary of the association.

Office work in the analysis and compilation of data for the 1930 report on the activities of California irrigation districts has been continued throughout the month.

Field visits were made and conferences held with officials of South San Joaquin, Tracy-Clover, Naglee-Burk and West Stanislaus irrigation districts in San Joaquin and Stanislaus counties; the El Dorado Irrigation District, El Dorado County; the Princeton-Codora-Glenn, Glenn-Colusa and Provident irrigation districts in Glenn and Colusa counties; the Camp Far West and Cordua irrigation districts in Placer and Yuba counties; and the Richvale Irrigation District in Butte County, for the purposes of discussing matters connected with the economic operation of these districts.

An inspection of the Salt Springs Valley reservoir, Calaveras County, was made in connection with the tentative proposal of the Linden irrigation district to purchase the same.

Notice has been received by the State Engineer from the proponents of their intention to file with the supervisors of Kings County a petition proposing the organization of an irrigation district to be known as the Empire West Side Irrigation District, covering an area of 7100 acres located along the west side of the lower Kings River.

The following matters were referred to the California Bond Certification Commission by the State Engineer for the consideration and action of the Commission:

(1) Request for approval to proceed with a bond issue in the amount of \$137,000 by the Linden Irrigation District.

(2) Request for approval of expenditures by the El Nido Irrigation District in the amount of \$87,000 for developments within the district.

(3) Request for approval of expenditures jointly by the Carpenter and Serrano irrigation districts in the amount of \$298,500 for construction of Santiago Creek dam.

(4) Consideration of the proposal of a refunding issue by the Oakdale Irrigation District affecting the bonds of the first and third issues of this district amounting to a total of \$2,000,000.

DAMS

The department has, during the above period, continued its activities, directed toward final action on existing dams which have been found to be in a satisfactory condition, with a view to their approval. Frequent supervision has been maintained on the construction and repair of dams.

To date 748 applications for approval of existing dams are on file; 59 applications have been filed for approval of plans and specifications for construction or enlargement and 131 applications for approval of plans for repair or alteration.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR REPAIR OR ALTERATION

Dam	Owner	County
Lake Grace	Pacific Gas and Electric Company	Shasta
North Battle Creek	Pacific Gas and Electric Company	Shasta
Fairmont	City of Los Angeles	Los Angeles

PLANS APPROVED FOR CONSTRUCTION OR ENLARGEMENT

Dam	Owner	County
*Garner No. 1	Childs and Waller	Shasta
**Hawkins	C. N. Hawkins	San Benito
**Chatsworth	City of Los Angeles	Los Angeles
** New construction		
** Enlargement		

The Chatsworth project contemplates raising the two earthen structures at that reservoir so as to impound 10,500 acre-feet for the water supply of the city of Los Angeles.

In passing upon this project, the State Engineer has availed himself of the engineering experience of Mr. J. B. Lippincott, Consulting Engineer of Los Angeles, and of Prof. Chas. D. Marx, Consulting Engineer of Stanford University. Dr. John P. Buwalda, of the California Institute of Technology, an outstanding consulting geologist, completes the personnel of the State's consultants. After an exhaustive study by the department, and a favorable report by the consultants, the application for approval of plans for this enlargement was approved on March 24.

PLANS APPROVED FOR REPAIR OR ALTERATION

Dam	Owner	County
Lower Franklin	City of Los Angeles	Los Angeles
Orr Creek	Pacific Gas and Electric Company	Placer
Silva Flat	Homer C. Jack	Lassen
Lake Grace	Pacific Gas and Electric Company	Shasta
McMahon Gulch	Diana and Patroni	San Mateo

An order authorizing use of Salt Springs dam up to elevation 3915 was issued pending completion of the dam.

Almost 100 dams have been carefully examined as to design and actual construction conditions and have

been found to meet the requirements of safety. Certificates of approval on these dams will soon be issued.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The maintenance force in Sutter County of eight men, exclusive of pump operators, has been engaged during the period in miscellaneous routine maintenance in connection with the by-pass structures, levees, drainage canals and pumping plants. Repairs to the Franklin road bridge, estimated to cost \$1,000, have been commenced with our own equipment. The work will consist of driving five new pile bents in the borrow pit and repairing the bridge deck. Plans are being made for the repair of the Hoke bridge, which has been closed for a year on account of its unsafe condition. There has been no high water, and therefore no occasion for the customary winter repair work.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

All cooperative bank protection work for the current season has been completed. The river floating equipment is being repaired and painted by the caretakers.

EMERGENCY FLOOD CONTROL AND RECTIFICATION OF RIVERS

Construction is now under way by the Hammond and Little River Redwood Company, in cooperation with the State and Humboldt County, of channel rectification work at the mouth of Little river in Humboldt County. This will consist of a timber dam and the excavation and cleaning of the old river channel.

Channel rectification work on the San Jacinto river in cooperation with landowners and the county of Riverside is now under way, estimated cost \$3,150. A small levee 2100 feet long protected with a wire fence barrier is being constructed.

Russian River Jetty: The funds provided by the Division of Fish and Game for the maintenance of the jetty structure have been expended in the placing of rock, repairs to the structure and improvement of the railroad. The appropriation of \$22,500 by Chapter 60, Statutes of 1931, is now being used in placing rock in the structure. A crew of eleven men is employed in the quarry and on the railroad. On account of the severe storm conditions no attempt will be made to continue the construction seaward until May 15 or later.

Navarro River Jetty: There is now available \$500 for additional work on the Navarro River jetty, with which additional rock will be set where it was displaced by the fall and winter storms.

Flood Measurements and Gages: All gages maintained by this Division are now in operation, but all streams have been at unusually low stage throughout the winter. There have been no floods or freshets to warrant flood meter measurements, for which preparations are complete. In the office all records are being brought to date for the purpose of incorporating in a report all that have not hitherto been published for the flood seasons of recent years.

MINNESOTA—The state highway department has just rounded out its first quarter century of service, having been organized in January, 1906.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

During the month of February there were nineteen applications to appropriate water received by the Division, eleven applications were canceled, nine permits were issued, five permits were revoked and eight licenses were issued.

During the 1930 field season 182 projects were inspected and compilation of reports covering these inspections was completed during the current month. These reports will form the basis of recommendations for license or revocation in 83 per cent of the cases, which is a better percentage of actions than in any preceding year.

Field work in connection with permit inspections during the current season has been outlined and will begin on March 29th. There are 223 projects listed for inspection scattered throughout the full length and breadth of the State.

A study has also been undertaken of the desirability and practicability of revising the practice of the Division in the matter of appropriation allowances for irrigation use. The practice has been to express direct diversion allowance (i.e., those which are made for immediate use as distinguished from storage) in terms of cubic feet per second, the rate being determined by the estimated requirement in the month of maximum demand, and expressed as the continuous flow equivalent thereof. There is some objection to this practice because in some instances the manner of use is determined rather by the availability of water (i.e., water is not always available in the source and the irrigator must divert when the supply is available rather than when the immediate needs of the crop would demand) and in other instances peculiarities of the crop demand that the whole, or practically the whole of the annual supply of irrigation water must be applied at one time or at least in a very short period and the rate of diversion is properly governed solely by the capacity of the diversion works. It is desired to ascertain to what extent the present practice of the office in the matter is inconsistent with best irrigation practice, and whether or not any modification of current practice of the office is practicable and desirable.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Case pending in the Superior Court of Shasta County, awaiting the Court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Action by referee is being deferred awaiting receipt of a stipulation for consent judgment signed by all of the parties involved.

Davis Creek (Modoc County). The two exceptions to the report of referee which had been filed in this case were heard before the Superior Court of Modoc

County on March 9. The issues raised by these exceptions were settled by stipulation between the parties involved, and the case is now pending in the court awaiting issuance of a decree.

Mill Creek (Modoc County). A stipulation for consent judgment defining the water rights on the stream system was presented to the water users at a conference held at Lake City on March 17, 1931. Fifty per cent of the water users signed the stipulation at that time, and many of the others present expressed the desire to meet with representatives of the Division for further discussion of the stipulation before signing the same. The stipulation is now being circulated among these latter parties.

Deep Creek (Modoc County). At a conference held at Cedarville on March 16, 1931, the Deep Creek water users entered into an agreement providing for administration by the Division of Water Resources of a schedule of allotments for trial distribution during the 1931 irrigation season.

Franklin Creek (Modoc County). The Franklin Creek water users, at a conference held at Alturas on March 16, 1931, entered into an agreement providing for administration by the Division of Water Resources of a schedule of allotments for trial distribution during the 1931 irrigation season.

New Pine Creek (Modoc County). Field work on the investigation was commenced during the latter part of March, and is being conducted in conjunction with water master service on the various streams in Modoc County.

WATER DISTRIBUTION

Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl and Soldier Creeks (Modoc County). Water Master service was commenced on these streams for the 1931 season during the latter part of March, and involves the distribution of water for approximately 16,000 acres of land.

Pit River (Modoc and Lassen Counties). The water users of Hot Springs Valley Irrigation District have entered into an agreement for the 1931 irrigation season to permit supervision of their diversions from Pit River by the Resident Engineer in Charge of the Pit River Investigation. This work will be carried on in conjunction with the supervision of diversions from Pit River in Big Valley which was commenced on March 1. Administration of the two areas will involve supervision over diversions supplying water for the irrigation of approximately 16,000 acres of land.

CALIFORNIA COOPERATIVE SNOW SURVEYS

The regular snow surveys at the key courses were made through arrangements with all cooperating agencies in the last few days of February. The results of these surveys, together with all precipitation data to March 1 from the stations of the U. S. Weather Bureau, State, districts and public utilities, were published in the monthly snow survey bulletin issued early in March.

It was shown that the water content of the snow as determined at the various snow courses on March 1st of this year in per cent of the water content on March 1, 1930, varied throughout the Sierra from 50 to 95 per cent and by stream basins was as follows: Upper Sacramento and McCloud (one course) 55 per cent; Feather (2 courses) 50 per cent; Yuba (4 courses) 75 per cent; American (3 courses) 70 per cent; Mokelumne (2 courses) 70 per cent; Stanislaus (3 courses) 65 per cent; Tuolumne (6 courses) 70 per cent; Merced (6 courses) 95 per cent; Mono (2

courses) 60 per cent; Upper San Joaquin (1 course) 95 per cent; Kings (1 course) 70 per cent.

In those few areas where snow surveys have been made a sufficient number of years to permit the development of "normals" the water content of the snow in per cent of the normal water content for the entire season (as of April 1) was found to be: Yuba Basin (3 courses) 50 per cent; American and Mokelumne Basins (1 course each) 45 per cent; Mono Basin (2 courses) 30 per cent; Upper San Joaquin Basin (1 course) 40 per cent.

The data from the precipitation stations showed the average precipitation to March 1st in per cent of the normal to the same date varying throughout the State from 50 to 85 per cent and by stream basins as follows: Upper Sacramento, McCloud and Pit, 50-60 per cent; Feather and Yuba, 55 per cent; American, 60 per cent; Mokelumne, 65 per cent; Stanislaus, 80 per cent; Tuolumne and Merced, 65 per cent; Mono, 60 per cent; Upper San Joaquin, 55 per cent; Owens, 50 per cent; Kings, 55 per cent; Kaweah, 65 per cent; Kern, 70 per cent; Santa Ana and Los Angeles, 75 per cent; and San Gabriel, 85 per cent.

Since the publication of the March bulletin, a further estimate of water supply conditions for the coming summer, based upon general knowledge of the March precipitation to date and the definite data to March 1st, indicates in general a water situation closely approaching that of 1924. It is to be noted, however, that the main survey of all snow courses as a basis for stream flow forecasts, has been in progress during the last few days of March and will be completed very shortly. This will furnish the data for the April bulletin and a more detailed forecast of water supply therein.

In the office, aside from the computations necessary in the preparation of the bulletins, computations have been made of the natural run-off for the 1929-30 season at the main gaging stations of all the major stream basins and other work of this character has been done in continuation of the study of the relation between snow and run-off.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The work of the past month under this project has been confined chiefly to the computations necessary in the preparation of the report for the 1930 season covering all diversions, stream flow, return flow, etc., throughout the Sacramento-San Joaquin territory. These computations are nearing completion and preparations will soon be under way for the commencement of the field season. It is indicated that the coming season may be one of very low water supply and it is probable that this will entail considerable extra field work. If the situation is such as to require diversion regulation or the operation of a diversion schedule, an increase in the field forces may be required.

The small amount of field work during the past month has included regular observations, tide gage maintenance, and maintenance of tanks being used in a determination of the consumptive use of water of aquatic plants.

The salinity sampling has continued at thirty stations and tide gages have been maintained at eight points between Collinsville and Sacramento. A new salinity station was established on Dutch Slough for observations in connection with the proposed Industrial Diversion. The following are com-

parative salinity and stream flow data for 1930 and 1931.

Station	Salinity in parts of Chlorine per 100,000	
	March 14, 1931	March 14, 1930
Bullhead Point -----	450	195
O. and A. Ferry -----	48	5
Collinsville -----	8	2
Antioch -----	9	5
Jersey -----	5	5
Emmerton -----	2	4
Webb Pump -----	6	5

Station	Discharged in second-feet	
	March 20, 1931	March 30, 1930
Sacramento River at Sacramento -----	24,000	39,300

WATER RESOURCES

Ventura County Investigation.—During the past month the ma, or flood of the year occurred, the peak being larger than any discharge since 1927. While the discharge was not large yet at its peak the flow into the ocean was 5500 second-feet from Santa Clara River.

South Coastal Basin Investigation.—This investigation has continued in a routine way during the month and a few additional engineers were placed on the work.

Mojave River Investigation.—This investigation has continued in a routine way during the month.

Santa Clara Valley Investigation.—This investigation has continued in a routine way during the month.

Pit River Investigation (Modoc and Lassen Counties).—Routine field work was continued throughout the month. The survey of the irrigated areas located on several small streams tributary to Pit River has been resumed. A meeting of the Permanent Committee with representatives of the Division of Water Resources and some 60 water users was held at Lookout on February 25. The Progress Report on the Pit River Investigation for the year ending September 30, 1930 was presented, and the work accomplished and the results obtained to date were reviewed. The meeting was then given over to open discussion of an outline of the field work to be accomplished prior to September 30, 1931.

Napa Valley Investigation.—Regular stream flow measurements on Napa River and Conn Creek were continued during the month and because of the peculiar State interest in the water crop of Rector Creek, which is looked upon as a possible future source of water supply for local State institutions, the investigation has been broadened to include stream flow measurements on that creek. Additional surveys have been made to determine more accurately the location of wells which are under observation and the elevation thereof.

A survey was also made to determine the location and capacity of pumps which are operated on Napa River and Conn Creek at points intervening between the upper and lower gaging stations.

A reconnaissance was made of Sulphur Spring and Pope Creeks for reservoir sites but nothing of present practicable value was found.

Water Resources Reports.—Effective progress has been made in completing the reports on the water resources investigation covering the State Water Plan for coordination, development, conservation and utilization of the water resources of the State under the provisions of Chapter 832 of the Statutes of 1929.

On March 4, advance copy of Bulletin 25, entitled "Report to the Legislature of 1931 on State Water Plan" was transmitted to the Governor and members of the Legislature. The report on the State Water

Plan presents a practical engineering recommendation providing for a system of physical works which would make available a water supply for the benefit of 75% of the agricultural area of the State. Recommendations in the report cover units to meet the most pressing immediate requirements and plans for the ultimate development of all water resources of California.

In addition to Bulletin 25, there were transmitted printed copies of the following:

- Bulletin 28A, "Industrial Survey of Upper San Francisco Bay Area."
- Bulletin 31, "Santa Ana River Basin."
- Bulletin 32, "South Coastal Basin."
- Bulletin 34, "Permissible Annual Charges for Irrigation Water in Upper San Joaquin Valley."

Also, advance mimeographed copies of the following reports:

- Bulletin 23, "Rainfall Penetration and Consumptive Use of Water in Santa Ana River Valley and Coastal Plain."
- Bulletin 26, "Cost of Irrigation Water in California."

It is anticipated a further number of bulletins will be received from the State Printer during the next three to four weeks.

MISCELLANEOUS ACTIVITIES

In completion of the field trips which have been made from time to time during the past year by representatives of the State, the U. S. Army Engineers and the U. S. Geological Survey for the location of gaging stations, a trip was made during the past month to locate stations in the Southern San Joaquin Valley. Locations were made on Caliente Creek near Caliente and on Los Gatos Creek near Coalinga. A location was inspected on Poso Creek but found unsuitable. Except for a location on the American River at Coloma, this completes the program for the location of fourteen new stations and the installation of recorders at eighteen old stations throughout the San Joaquin drainage basins in accordance with the Federal-State Cooperative Agreement.

STATE HIGHWAY PROGRESS REPORT

as of April 1, 1931.

C. H. PURCELL, Chief.

Construction Program Under Full Speed.

During the months of April, May and June, the work now in preparation indicates that we will have about 365 miles of road projects estimated to cost approximately \$10,180,000, advertised or with construction already started. The closest estimate we can make indicates that about 4500 men will be required for this construction for the normal construction crews without counting in the many hundreds of other men who are employed by commercial plants. From our experience with unemployment camps, we feel that each one of the persons employed will probably take care of two to three others so that in effect the program will care for a great many thousands. The value of this work is enhanced by its very general distribution over the whole State.

It should be noted that 84 per cent of the \$10,780,000 total referred to above comes from funds of the eighty-third and eighty-fourth fiscal years extending from July 1, 1931, to June 30, 1933. Under ordinary circumstances, this money would not be available until the beginning of the fiscal year, in this instance July 1, 1931. These expenditures have been advanced in accordance with the employment policy of Governor Rolph that public work must be speeded up to the maximum.

Record Day for Bid Openings.

Wednesday, March 25th, was a record day in State highway circles.

On that day, bids were opened on State highway projects, the total material and labor cost of which will run to \$860,000. This establishes a new high point in State highway history for projects offered to contractors on any one day.

Wednesday's record opening is followed closely by those of today (April 1st) when bids were opened on contracts, the total cost of which exceeds \$700,000.

Relief Employment.

Relief employment funds work will be exhausted shortly after April 1st in some districts, and probably by April 15th in all districts. This work has employed over 1700 men since November on a three-day-a-week basis.

Program for Maintenance Activities.

The routine maintenance work will continue at the present rate during the next three months. In addition dust oil is to be applied to 1063 miles of our earth and rock surfaced roads, and on 330 miles of shoulders along side pavement. In the Eureka district and certain other sections where employment conditions are most acute, this work will be handled by day labor forces to give the benefit to local men. In the main, however, the work will be handled under contract arrangement during April and May. This work will cost approximately \$300,000 and will provide employment for possibly 150 to 200 men.

The work of reinforcing rock surfaces and constructing oil surfacing and constructing oil rock borders in an estimated amount of \$700,000 will be started in April and should be practically completed by August 1st. This work will provide employment for possibly 300 men. Like the dust oiling, the jobs are well scattered throughout the State. The estimated labor is actual labor on the job and, of course, is in addition to labor which goes into producing and shipping of oil rock, etc.

This work of the maintenance department is largely seasonal and the volume depends entirely on available funds as set up in the Governor's budget. No special action is required to insure that this work will be started, as preliminary arrangements are now well under way.

HIGHWAY BIDS AND AWARDS For Month of March

IMPERIAL COUNTY—Between Holtville and East High Line Canal, gravel and paved with Portland concrete cement. Dist. VIII, Rt. 27, Sec. D, Central California Roads Co. & Southern California Roads Co., Los Angeles, \$209,155; Wells & Bressler, Santa Ana, \$327,551; McCray Co., Los Angeles, \$284,075; Sander Pearson, Santa Monica, \$324,642; Basich Bros. Const. Co., Torrance, \$256,929; Griffith Co., Los Angeles, \$286,978. Contract awarded to Jahn & Bressi Const. Co., Inc., Los Angeles, \$246,159.

KERN COUNTY—Between Grapevine and Bakersfield, grading and shoulders surfaced with bituminous treated crushed gravel, about 29.8 miles in length. Dist. VI, Rt. 4, Sec. B & C, Gibbons & Reed Co., Burbank, \$323,870; P. J. Akmadzich, Los Angeles, \$284,513; Fredrickson & Watson Const. Company and Fredrickson Bros., Oakland, \$272,686; G. W. Ellis, Los Angeles, \$279,514; Hartman Const. Co., Bakersfield, \$285,777; Southwest Paving Co., Los Angeles, \$319,772; Fred W. Nighbert, Bakersfield, \$275,225. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$264,404.

LAKE COUNTY—Between Middletown and the Ukiah-Tahoe Highway, 25 miles. Dist. IV, Rt. 49, Sec. A B C, Peres & Gatto, Richmond, \$5,992; Chas. Knuppinger, Lakeport, \$5,292; Edward A. Peres, Richmond, \$6,888; C. F. Fredrickson & Sons, Lower Lake, \$5,544; Jack Casson, Hayward, \$5,460. Contract awarded to Basalt Rock Co., Napa, \$5,050.

MENDOCINO COUNTY—Between Pepperwood Sch. and Little Dan Cr., 13.5 miles to be paved with Bituminous treat crushed gravel of which 5.5 miles is to be graded 24 feet wide. Dist. I, Rt. 1, Sec. II-1, Hemstreet & Bell, Marysville, \$531,051; J. F. Knapp, Oakland, \$590,571; T. E. Connolly, San Francisco, \$636,309; George Pollock Co., Sacramento, \$543,207; Robinson Roberts Co., Los Angeles, \$524,478; Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$558,511; MacDonald & Kahn Co., Ltd., San Francisco, \$577,980; General Construction Co., Seattle, \$636,393; Healy-Tibbitts Construction Co., San Francisco, \$527,560; Granfield, Farrar & Carlin, San Francisco, \$625,247; R. L. Crooks & Co., Portland, \$634,563; W. S. Mead, Oakland, \$581,569; Morrison, Knudsen Co., Boise, \$556,525; Kern & Kibbe, Portland, \$704,513. Contract awarded to E. C. Coats, Sacramento, \$438,470.

MENDOCINO COUNTY—From Devoy Grove and the northerly boundary. Dist. I, Rt. 1, Sec. K, Hemstreet & Bell, Marysville, \$14,223; H. H. Boomer, San Francisco, \$12,734; J. F. Knapp, Oakland, \$17,979; Smith Bros. Co., Eureka, \$15,047. Contract awarded to Chigris & Sutsos, San Francisco, \$11,297.

MONTEREY COUNTY—Between 2 miles north of Salinas and the northerly boundary. Dist. V, Rt. 2, Sec. J, about 11 miles to be graded and paved with Portland concrete cement. Jahn Bressi Const. Co., Los Angeles, \$486,913; Macco Const. Co., Clearwater, \$536,407; Healy-Tibbitts Const. Co., San Francisco, \$509,871; Fredrickson Watson Const. Co., and Fredrickson Bros., Oakland, \$436,518; J. F. Knapp, Oakland, \$509,931; Will E. Peck Co., Los Angeles, \$481,147; N. M. Ball, Porterville, \$483,589; Union Paving Company, San Francisco, \$482,586; C. W. Wood, Stockton, \$477,036; Hanrahan Co., San Francisco, \$474,300; Davis H. Ryan, San Diego, \$509,215; Basich Bros. Const. Co., Torrance, \$464,830. Contract awarded to Peninsula Paving Co., San Francisco, \$459,158.

MONTEREY COUNTY—Bridge across Garrapata Creek, reinforced concrete 1-150 arch span and 5-25 girder spans, and about 0.28 miles to be graded. Dist. V, Rt. 56, Sec. G, A. W. Kitchen, San Francisco, \$53,980; M. B. McGowan, San Francisco, \$54,223; Paul M. White, Santa Monica, \$46,298; Oberg Bros., Los Angeles, \$39,810; Geo. J. Ulrich Const. Co., Modesto, \$46,017; Rocco & Caletti, San Rafael, \$48,605. Contract awarded to Hanrahan Company, San Francisco, \$37,835.

ORANGE COUNTY—At Goliwin overhead crossing, graded and paved Portland cement concrete, 0.9 miles. Dist. VII, Rt. 2, Sec. B, P. J. Akmadzich, Los Angeles, \$42,790; Matich Bros., Elsinore, \$37,359; Wells & Bessler, Santa Ana, \$46,529; Korace-

vich & Price, South Gate, \$41,727. Contract awarded to Griffith Co., Los Angeles, \$35,807.

PLACER COUNTY—Undergrade crossing at New England Mills, 2 concrete abutments graveled and surfaced, 1000 lineal feet of roadway with bituminous treated crushed gravel. Dist. III, Rt. 37, Sec. B, C. W. Wood, Stockton, \$36,115; Fredrickson & Watson Const. Co., Oakland, \$38,768; Lindgren & Swinerton, Inc., Sacramento, \$37,104; J. W. Hoopes, Sacramento, \$45,604; C. Emil Force, Piedmont, \$40,644; Bodenhamer Const. Co., Oakland, \$39,086; P. F. Bender, North Sacramento, \$36,264. Contract awarded to W. H. Hauser, Oakland, \$32,521.

SAN BERNARDINO COUNTY—Bridge across Lytle Cr., 2 miles west of San Bernardino, 5-35' steel stringer spans concrete deck on pile bents. Dist. VIII, Rt. 9, Sec. C. Oberg Bros., Los Angeles, \$35,486; W. H. McCune, Jr., Monrovia, \$41,468; Byerts & Dunn, Los Angeles, \$33,605. Contract awarded to Robinson-Roberts Co., Los Angeles, \$33,313.

SAN BERNARDINO COUNTY—Between Cronise Valley and 6 miles west of Baker, grading and surfacing with oil treated crushed gravel, 13.6 miles. Dist. VIII, Rt. 31, Sec. J-K, Geo. Herz & Co., San Bernardino, \$255,450; O. A. Lindburg, Stockton, \$266,235; A. Teichert & Son, Inc., Sacramento, \$268,293; Robinson, Roberts Co., Los Angeles, \$279,727; Chas. U. Heuser, Glendale, \$268,510; Morrison-Knudsen Co., Boise, \$271,414; H. W. Rohl Co., Los Angeles, \$248,796; Fred W. Nighbert, Bakersfield, \$259,310. Contract awarded to McCray Co., Los Angeles, \$247,706.

SAN BERNARDINO COUNTY—Reinforced concrete Girder Bridge over A. T. & S. P. Ry., 2 miles east of Essex, 1-48', 4-34' spans on concrete bents. Dist. VIII, Rt. 58, Sec. 1, Byerts & Dunn, Los Angeles, \$24,593; Robt. E. McKee, Los Angeles, \$25,971; Johnson Const. Co., Los Angeles, \$28,892. Contract awarded to H. W. Rohl Co., Los Angeles, \$20,885.

SAN LUIS OBISPO COUNTY—Between 1.5 miles south of San Margarita and Atascadero, grading and paving with asphalt concrete 9.8 miles. Dist. V, Rt. 2, Sec. C-D, Central California Rds. & Southern Cal. Rds. Co., Los Angeles, \$250,841; Irving L. Rider, San Jose, \$229,330; A. Teichert & Son, Sacramento, \$233,620; Peninsula Paving Co., San Francisco, \$224,279; Clark & Henry Const. Co., San Francisco, \$236,749; P. J. Akmadzich, Los Angeles, \$341,389. Contract awarded to Hanrahan Company, San Francisco, \$209,700.

SAN LUIS OBISPO COUNTY—Repair bridge across Estrella River, about 12 miles east of Paso Robles, consisting of one 154 ft. through steel truss span. Dist. V, Rt. 33, Sec. B, Lord & Bishop, Sacramento, \$1,275. Contract awarded to Wm. Lane, Paso Robles, \$1,247.

SAN MATEO & SANTA CLARA COUNTIES—Bridge across San Francisquito Creek at Palo Alto, 3-27' spans on concrete pile bents. Dist. IV, Rt. 68, Sec. D-A, A. T. Howe, Santa Rosa, \$24,954; Fredrickson & Watson Const. Co., Oakland, \$22,094; J. W. Hoopes, Sacramento, \$20,270; Geo. J. Ulrich Const. Co., Modesto, \$20,220; Peter McHugh, San Francisco, \$26,387; M. B. McGowan, San Francisco, \$20,675; MacDonald & Kahn Co., Ltd., San Francisco, \$19,999; Clinton Stephenson Const. Co., San Francisco, \$22,986; Ralph Hunter, Sacramento, \$21,839; Healy-Tibbets Const. Co., San Francisco, \$24,395; A. W. Kitchen, San Francisco, \$21,506; A. J. Raich, San Jose, \$22,440; Merritt, Chapman & Scott Corp., San Pedro, \$25,462; Paul M. White, Santa Monica, \$21,279. Contract awarded to Barrett & Hill, San Francisco, \$17,218.

SANTA BARBARA COUNTY—Reinforced concrete arch bridge across Gaviota Creek, 1-100' span. Dist. V, Rt. 2, Sec. E, Byerts & Dunn, Los Angeles, \$53,062; Gist & Bell, Arcadia, \$47,637; Merritt & Chapman Corp., San Pedro, \$54,483; Oberg Bros., Los Angeles, \$43,336. Contract awarded to Paul M. White, Santa Monica, \$36,287.

ARCHITECTURAL AWARDS For Month of March

SONOMA STATE HOME—Continuous type bake oven, to Petersen Oven Company, San Francisco, \$3,450.

AGRICULTURAL PARK (State Fair Grounds), Sacramento—Additional Live Stock Building, contract for general work to F. L. Hansen, San Francisco, \$97,500; for electrical work, to C. E. Turner, Sacramento, \$2,278; for plumbing work to Carpenter & Mendenhall, Sacramento, \$8,370.

Contract for general work on Poultry Building to Yoho Dinger, Sacramento, \$43,743.

SAN DIEGO STATE TEACHERS COLLEGE—Grading athletic field, to R. A. Floyd Engineering Company, San Diego, \$2,030.

WHITTIER STATE SCHOOL—Building for Boys, contract for general work to Gene B. Foster, Los Angeles, \$25,082; for plumbing and heating, to Cooby Winterbottom, Los Angeles, \$5,060; for electrical work to R. R. Jones Electric Co., South Pasadena, \$1,355.

ATTORNEY GENERAL'S OFFICE, State Office Building, San Francisco—Alterations, to Braus Kuhn, San Francisco, \$1,740.

NORWALK STATE HOSPITAL—Installation refrigeration plant, to Baker Ice Machine Company, Los Angeles, \$5,351.

PACIFIC COLONY—Employees' Quarters and Garage No. 2, contract for general work to Louis A. Geisler, Huntington Park, \$30,986; plumbing and heating to Thos. Haverly Co., Los Angeles, \$5,999; electrical work to R. R. Jones Electric Co., South Pasadena, \$1,250.

DAM APPLICATIONS AND APPROVALS

Application for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1931.

MODOC COUNTY—Lindauer Concrete Dam No. 152-4. G. Lindauer, San Francisco, California, owner; buttress and flashboards 13½ feet above streambed with a storage capacity of 550 acre-feet, situated on Pit River tributary to Sacramento River. For Diversion and storage purposes, for irrigation and stock use.

MODOC COUNTY—Lindauer Upper Dam No. 152-5. G. Lindauer, San Francisco, California owner; crib and needle dam, 8 feet above streambed with a storage capacity of 850 acre-feet, situated on Pit River tributary to Sacramento River. For diversion and storage purposes for irrigation and stock use.

MODOC COUNTY—O'Brien Dam No. 152-6. O'Brien and O'Connell Estates, Alturas, owner; crib and flashboards, 10½ feet above streambed with a storage capacity of 1000 acre-feet, situated on Pit River tributary to Sacramento River. For diversion and storage purposes, for irrigation and stock use.

SOLANO COUNTY—Suisun Municipal Dam No. 21. Town of Suisun City, Suisun, California, owner; earth dam, 45 feet above streambed tributary to Suisun Creek in Sec. 12, T. 5 N., R. 3 W., M. D. B. and M., for storage purposes, for municipal use.

YOLO COUNTY—Moore Diversion Dam No. 391-3. Clear Lake Water Company, Woodland, California, owner; flashboards, 6 feet above streambed with a storage capacity of 40 acre-feet, situated on Cache Creek tributary to Sacramento River in T. 10 N., R. 1 E., M. D. B. and M., for diversion purposes, for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1931.

LOS ANGELES COUNTY—Chatsworth Highline Dam No. 6-32. City of Los Angeles, Los Angeles, owner; earthfill, 49 feet above streambed with a storage capacity of 280 acre-feet, situated on a wash tributary to Los Angeles River in Sec. 9, T. 2 N., R. 16 W., S. B. and M., for regulation and storage purposes, for irrigation and domestic use. Estimated cost \$100-, 385.80, fees paid \$1,001.93.

LOS ANGELES COUNTY—Haypress Dam No. 778-3. Santa Catalina Island Company, Avalon, California, owner; earth dam, 16.9 feet above streambed with a storage capacity of 20.7 acre-feet, situated on Haypress Creek tributary to Grand Canyon in Sec. 32, T. 9 S., R. 14 W., S. B. and M., for storage purposes for domestic use. Estimated cost \$4223.77, fees paid \$42.24.

LASSEN COUNTY—Quaking Asp Gulch No. 1 Dam No. 253-2. Antone Avilla, Red Bluff, owner; earth dam, 10 feet above streambed with a storage capacity of 33 acre-feet, situated on Quaking Asp Gulch in Sec. 7, T. 36 N., R. 10 E., M. D. B. and M., for storage purposes for stock watering use. Estimated cost \$500, fees paid \$20.

LASSEN COUNTY—Quaking Asp Gulch No. 2 Dam No. 253-3. Antone Avilla, Red Bluff, owner; earth dam, 8 feet above streambed with a storage capacity of 30 acre-feet, situated on Quaking Asp Gulch in Sec. 13, T. 36 N., R. 9 E., M. D. B. and M., for storage purposes, for stock watering use. Estimated cost \$590, fees paid \$20.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of March, 1931.

SHASTA COUNTY—North Battle Creek Dam No. 97-96. Pacific Gas and Electric Company, San Francisco, owner; situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. B. and M.

LOS ANGELES COUNTY—Fairmont Dam No. 6-8. City of Los Angeles, Los Angeles, California, owner; earthfill, located in Sec. 12, T. 7 N., R. 15 W., S. B. and M.

PLUMAS COUNTY—Eureka Lake Dam No. 283. Phinias-Eureka Corp., Johnsville, California, owner; situated on Eureka Creek tributary to Feather River in T. 22 N., R. 11 E., M. D. B. and M. Earth and rock dam.

TUOLUMNE COUNTY—Matelot Dam No. 97-75. Pacific Gas and Electric Company, San Francisco, owner; earth dam, located in Sec. 1, T. 2 N., R. 14 E., M. D. B. and M.

TUOLUMNE COUNTY—San Diego Dam No. 97-82. Pacific Gas and Electric Company, San Francisco, earth dam, located in Sec. 13, T. 2 N., R. 14 E., M. D. B. and M.

PLACER COUNTY—Kidd Lake Dam No. 97-25. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on a small creek tributary to South Yuba River in Sec. 29, T. 17 N., R. 14 E., M. D. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of March, 1931.

SAN BENITO COUNTY—Hawkins Dam No. 651. C. N. Hawkins, Helister, California, owner; hydraulic fill, 67 feet above streambed with a storage capacity of 1000 acre-feet, situated on Los Viboras Creek tributary to Pajaro River. For storage purposes, for irrigation use.

LOS ANGELES COUNTY—Chatsworth Dam No. 6-4. City of Los Angeles, Los Angeles, owner; earth dam, 40 feet above streambed with a storage capacity of 10-, 500 acre-feet, situated on Chatsworth Foot Hills tribu-

tary to Los Angeles River in Ex Mission de San Fernando, for storage purposes, for municipal, domestic and irrigation use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of March, 1931.

SHASTA COUNTY—Lake Grace Dam No. 97-92. Pacific Gas and Electric Company, San Francisco, owner; earth dam, located in Sec. 4, T. 30 N., R. 1 E., M. D. B. and M.

SHASTA COUNTY—North Battle Creek Dam No. 97-96. Pacific Gas and Electric Company, San Francisco, owner; masonry, situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. B. and M.

LOS ANGELES COUNTY—Fairmont Dam No. 6-8. City of Los Angeles, Los Angeles, owner; earth dam, located in Sec. 12, T. 7 N., R. 15 W., S. B. B. and M.

SAN MATEO COUNTY—McMahon Gulch Dam No. 608. Dianda and Patroni, Half Moon Bay, owners; earth dam, situated on McMahon Creek in T. 5 S., R. 6 W., M. D. B. and M.

WATER APPLICATIONS AND PERMITS

Applications for Permits to Appropriate Water Filed With the Department of Public Works, Division of Water Resources, During the Month of March, 1931.

BUTTE COUNTY—Application 6902. R. M. and H. L. Stafford, Live Oak, Calif., for 2.0 c.f.s. from Morrison Slough (Main Drain Ditch of Dist. 2056) tributary to Sacramento River. To be diverted in Sec. 13, T. 17 N., R. 2 E., M. D. B. and M., for irrigation purposes (160 acres). Estimated cost \$2,000.

EL DORADO COUNTY—Application 6903. U. S. Eldorado National Forest, Placerville, Calif., for 3000 gallons per day from Granite Lake Creek tributary to Emerald Bay, Lake Tahoe. To be diverted in Sec. 23, T. 13 N., R. 17 E., M. D. B. and M., for domestic and fire protection purposes. Estimated cost \$450.

LAKE COUNTY—Application 6904. C. G. Haycock, 2674 27th St., Sacramento, Calif., for 0.5 c.f.s. from Middle Creek tributary to Clear Lake and Cache Creek. To be diverted in Sec. 31, T. 16 N., R. 9 W., M. D. B. and M., for irrigation purposes (40.26 acres).

BUTTE COUNTY—Application 6905. California Mutual Building and Loan Association, a corp., San Jose, Calif., for 14.78 c.f.s. from Lateral "A" Drainage Canal of Reclamation District tributary to Butte Creek, thence Sacramento River. To be diverted in Sec. 13, T. 18 N., R. 2 E., M. D. B. and M., for irrigation purposes (5912 acres of rice).

SANTA BARBARA COUNTY—Application 6906. Union Realty Co., P. O. Box 820, Santa Barbara, Calif., 7 gallons per minute from San Marcos spring. To be diverted in Sec. 11, T. 5 N., R. 28 W., S. B. B. and M., for irrigation and domestic purposes (5 acres). Estimated cost \$1,200.

LOS ANGELES COUNTY—Application 6907. U. S. Angeles National Forest, 501 Brownstein-Louis Bldg., Los Angeles, Calif., for 0.002 c.f.s. or approximately 1300 g.p.d. from Camp Spring tributary to Shake Canyon. To be diverted in Sec. 13, T. 7 N., R. 16 W., S. B. B. and M., for domestic purposes. Estimated cost \$100.

LOS ANGELES COUNTY—Application 6908. U. S. Angeles National Forest, 501 Brownstein-Louis Bldg., Los Angeles, Calif., for 0.002 c.f.s. or approximately 1300 g.p.d. from Ranger Spring tributary to Pine Canyon. To be diverted in Sec. 18, T. 7 N., R. 15 W., S. B. B. and M., for domestic purposes. Estimated cost \$50.

VENTURA COUNTY—Application 6909. Hibbard S. Williams, P. O. Box 265, Santa Paula, Calif., for 0.025 c.f.s. from unnamed spring tributary to Timber Canyon, thence Santa Clara River. To be diverted in Sec. 18, T. 4 N., R. 20 W., S. B. B. and M., for mining and domestic purposes. Estimated cost \$1,000.

MENDOCINO COUNTY—Application 6910. Fred W. Gordon, Cummings, Mendocino County, Calif., for 0.05 c.f.s. from unnamed spring tributary to South Fork of Eel River. To be diverted in Sec. 3, T. 23 N., R. 17 W., M. D. B. and M., for domestic purposes. Estimated cost \$250.

HUMBOLDT COUNTY—Application 6911. Mrs. Sarah J. Carpenter, Salyer, Calif., for 2.0 c.f.s. from

Ammon Creek tributary to South Fork of Trinity River. To be diverted in Sec. 12, T. 5 N., R. 5 E., H. B. and M., for irrigation purposes (60 acres). Estimated cost \$800.

HUMBOLDT COUNTY—Application 6912. Redwood Empire Golf and Country Club, Scotia, Calif., for 6,267 c.f.s. from Wolverton Gulch tributary to Van Duzen and Eel Rivers. To be diverted in Sec. 8, T. 2 N., R. 1 E., H. B. and M., for irrigation and domestic purposes (30 acres). Estimated cost \$4,000.

MONO COUNTY—Application 6913. A. J. Warrington, Bridgeport, Calif., for 3.0 c.f.s. from Virginia Creek tributary to East Walker River. To be diverted in Sec. 2, T. 3 N., R. 25 E., M. D. B. and M., for mining purposes. Estimated cost \$50.

MONO COUNTY—Application 6914. A. J. Warrington, Bridgeport, Calif., for 3 c.f.s. from Dog Creek tributary to Virginia Creek and East Walker River. To be diverted in Sec. 16, T. 3 N., R. 25 E., M. D. B. and M., for mining purposes. Estimated cost \$1,500.

PLUTE COUNTY—Application 6915. J. E. Carrico, Diggs, Calif., for 0.81 c.f.s. from Feather River tributary to Sacramento River. To be diverted in Sec. 4, T. 18 N., R. 3 E., M. D. M., for irrigation purposes on 65 acres. Estimated cost \$400.

SAN BERNARDINO COUNTY—Application 6916. Aubrey Wardman, Whittier, Calif., for 2.5 c.f.s. from underground (shafts with lateral drifts). To be diverted in Sec. 16, T. 1 N., R. 6 W., S. B. M., for irrigation and domestic purposes on 225 acres. Estimated cost \$25,000.

TUOLUMNE COUNTY—Application 6917. W. C. Le Hane, Box 94, Modesto, Calif., for 600 c.f.s. from Stanislaus River tributary to San Joaquin River. To be diverted in Sec. 10, T. 1 S., R. 12 E., M. D. M., for irrigation purposes on 100,000 acres of land more or less, to be irrigated.

TRINITY COUNTY—Application 6918. Trinity Loop Mining Co., Marvin B. Sherwin, Secretary, Oakland, for 10 c.f.s. from Hawkins Creek tributary to Trinity River. To be diverted in Sec. 21, T. 6 N., R. 6 E., H. M. for mining and domestic purposes. Estimated cost \$6,000.

SUTTER COUNTY—Application 6919. W. S. and John W. Saunders, Tudor, Calif., for 15.5 c.f.s. from Feather River tributary to Sacramento River. To be diverted in Sec. 2, T. 13 N., R. 13 E., M. D. M., for irrigation purposes on 400 acres.

SUTTER COUNTY—Application 6920. Grover C. Shannon, Tudor, Calif., for 3.5 c.f.s. from Feather River tributary to Sacramento River. To be diverted in Sec. 2, T. 13 N., R. 3 E., M. D. M., for irrigation purposes on 85 acres.

TRINITY COUNTY—Application 6921. Colen F. Whittier, c/o Geo. Norenholt, 6327 W. 5th St., Los Angeles, Calif., for 150 c.f.s. from Soldier Creek tributary to Trinity River. To be diverted in Sec. 25, T. 33 N., R. 11 W., M. D. M., for mining and domestic purposes.

SAN BERNARDINO COUNTY—Application 6922. Carter E. Putnam, Cucamonga, Calif., for 0.20 c.f.s. from run-off of irrigation water (water runs in ditch by side of road) tributary to Santa Ana River Watershed. To be diverted in Sec. 2, T. 1 S., R. 7 W., S. B. M. for irrigation purposes. Estimated cost \$3.

SIERRA COUNTY—Application 6923. Geo. F. Taylor, Downieville, Cal., for 50 c.f.s. from Cherokee Creek tributary to North Fork of Yuba River. To be diverted in Sec. 6, T. 19 N., R. 9 E., M. D. M., for mining purposes.

NEVADA COUNTY—Application 6924. Fletcher Hamilton, San Francisco, Calif., for 25 c.f.s. from each source, not to exceed a total of 50 c.f.s. from (1) Rob Roy (2) Deadman (3) Roscoe and (4) Logan Canyons tributary to (1) and (2) Poorman Creek (3) and (4) S. Fork Yuba River. To be diverted in Secs. (1) 25 (2) 26 (3) and (4) 34, T. 18 N., R. 10 E., M. D. M., for mining and domestic purposes.

SUTTER COUNTY—Application 6925. Boyd Farm Co., Yuba City, Calif., for 20 c.f.s. from Feather River tributary to Sacramento River. To be diverted in Sec. 14, T. 14 N., R. 3 E., M. D. M., for irrigation purposes on 1,000+ acres.

SONOMA COUNTY—Application 6926. Albert P. Kogler, San Francisco, California, for 0.05 c.f.s. from Porter Creek tributary to Mark West Creek and Russian River. To be diverted in Sec. 14, T. 8 N., R. 7 W., M. D. M., for irrigation and domestic purposes on 21 acres. Estimated cost \$750.

LAKE COUNTY—Application 6927. Peter V. Pedroncini, Ukiah, Calif., for 0.1 c.f.s. from 2 unnamed springs tributary to Spruce Canyon to be diverted in

Sec. 11, T. 15 N., R. 11 W., M. D. M., for irrigation and domestic purposes on $\frac{1}{2}$ acre. Estimated cost \$3,000.

Permits to Appropriate Water Issued by the Department of Public Works, Division of Water Resources, During the Month of March, 1931.

SHASTA COUNTY—Permit 3662. Application 6702. Elmer Gastineau, Los Angeles, Calif., March 9 1931 for .02 c.f.s. from unnamed springs in Sec. 12, T. 32 N., R. 5 W., M. D. for irrigation and domestic use on 20 acres. Estimated cost \$250.

BUTTE COUNTY—Permit 3663. Application 6700. Harvey C. Adams, Chico, Calif., March 9, 1931 for 3 c.f.s. from drainage ditch from Drainage Dist. No. 2 in Sec. 28, T. 19 N., R. 1 E., M. D., for irrigation use on 120 acres. Estimated cost \$250.

MONO COUNTY—Permit 3664. Application 6744. Raymond S. MacMillan, Los Angeles, Calif., March 3, 1931 for 200 g.p.d. from unnamed spring in Sec. 14, T. 2 S., R. 26 E., M. D., for domestic purposes. Estimated cost \$150.

SIERRA COUNTY—Permit 3665. Application 6834. Langdon Smith, Downieville, Calif., March 10, 1931 for .003 c.f.s. from unnamed spring in Sec. 5, T. 19 N., R. 10 E., M. D., for domestic purposes. Estimated cost \$500.

MONTEREY COUNTY—Permit 3666. Application 6794. Stuart Haldorn, Monterey, Calif., March 16, 1931 for 2 c.f.s. from Higuera Creek in Sec. 24, T. 19 S., R. 1 E., M. D. M., for power purposes.

MONTEREY COUNTY—Permit 3667. Application 6795. Stuart Haldorn, Monterey, Calif., March 16, 1931 for 0.12 c.f.s. from Higuera Creek in Sec. 24, T. 19 S., R. 1 E., M. D., for irrigation and domestic uses.

SAN BERNARDINO COUNTY—Permit 3668. Application 6669. Geneva Catherine Baxter, Lucerne Valley, Calif., March 15, 1931 for 0.14 c.f.s. from (1) Deep Creek Canyon and (2) unnamed spring in Sec. (1) 16 (2) 10, T. 3 N., R. 1 W., S. B. and M., for irrigation and domestic use on 20 acres. Estimated cost \$150.

EL DORADO COUNTY—Permit 3669. Application 6410. Emil E. Larsen, Placerville, Calif., March 25, 1931 for 0.5 c.f.s. from South Fork Brush Canyon in Sec. 4, T. 10 N., R. 12 E., M. D., for irrigation and domestic use on 60 acres. Estimated cost \$300.

INYO COUNTY—Permit 3670. Application 6868. H. J. Halliday, Bishop, Calif., March 25, 1931 for .0035 c.f.s. from small unnamed stream in Sec. 2, T. 9 S., R. 31 E., M. D., for domestic and recreational uses. Estimated cost \$155.

HUMBOLDT COUNTY—Permit 3671. Application 6766. E. F. Barker and Beatrice Barker, Orleans, Cal., March 26, 1931 for 0.1 c.f.s. from unnamed Gulch in Sec. 15, T. 10 N., R. 5 E., H. M., for irrigation and domestic use on six acres.

TOO MUCH IRRIGATION

The following stanza is a neat the danger of our irrigation:

Countless worn-out fields remind us
We should build our lands to stay
And departing leave behind us
Fields that have not washed away.
When our boys assume the mortgage
On the land that's had our toil
They'll not have to ask the question
"Here's the land but where's the soil?"

First came the "realtor," then the "mortician," later the "beautician," subsequently the "bootician," then the "pedicure." And the other day a large dump truck careened down the avenue in one of our large cities bearing the imposing legend: "Kelly & McGuire, truckologists."

Jim the Porter: "Boss, de ladies has finally giv' in, ain't they?"

Boss: "Give in? How?"

Jim: "Well, I just now seen a sign down the street that said, 'Ladies' Ready-to-Wear Clothes.'"

Statistics Teach "Safety First" Lesson

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ILLUSTRATIVE of the imperative necessity of careful driving in thickly-populated districts and on open highway, the Bureau of Research, Statistics and Traffic Safety of the California Highway Patrol announces figures showing forty-two children killed and 511 injured in California during 1930 by vehicles striking them while they played on the roadway.

The figures show 25 per cent of all injured and 17 per cent of all killed in pedestrian accidents were children.

In this connection the bureau called attention to sections of the law requiring motorists to drive at a speed not exceeding 15 miles an hour in school zones and to stop when school buses are taking on or discharging passengers.

Of 31,019 motor vehicle accidents in California, involving injury or death during the year, 9198, or approximately 30 per cent involved collisions with pedestrians.

These collisions resulted in death or injury to 9627 persons. The actual deaths totaled 857. The injured totaled 8770.

Over one-third of the pedestrian accidents occurred at intersections and about one-fourth were due to "jay-walking." About 3 per cent involved persons walking along the highways and streets.

THE "HIT AND RUN" DRIVERS' TOLL

"Hit and run" drivers were involved in 114 accidents causing death and 1156 others causing injury in California during 1930.

As "hit and run" drivers are able to make their escape usually because witnesses fail to get their numbers, E. Raymond Cato, superintendent of the California Highway Patrol, said members of the patrol would be instructed to continue rigid enforcement of section 43 of the motor vehicle act requiring that license plates be displayed in a position clearly visible and be kept free from foreign matter such as dust and grease.

Among the convictions were 4500 for various speed violations. Four hundred thirty-four were convicted of reckless driving and 1000 were apprehended for faulty headlamps. There were but 65 drivers the month convicted of driving while intoxicated.

Famous last words: "Sure, stranger; climb in the back seat."

Rolph Signature to Secondary Highway Law Wins High Praise

(From the *San Bernardino Sun*)

THE adoption by the Legislature and the signature of Governor James Rolph, Jr., of the new secondary highway bill discharges an obligation long due California.

The bill adds 633 miles of highway to the secondary system on southern California. To the north went 171 miles of additional State highways.

The measure was designed to correct the injustice in the number of secondary highways provided for southern California.

Governor Rolph carried out his pledge to the people with his signature on this measure. It is his contribution to his determination that all sections of California shall be treated squarely. And it is easy for Governor Rolph to take the position that there is no north and no south in California, but one great State. He is a typical Californian.

There is no claim that Governor Rolph initiated the movement for justice in the allocation of State highways. But he did speedily make it a law. There was no disposition on his part to make it the subject of pork barrel politics.

Fire Wardens of Southern California Meet in Convention

THE Southern California Association of Foresters Firewardens held their second annual meeting at Avalon, Catalina Island, during the latter part of February.

The Southern California Association of Foresters and Firewardens came into being just two years ago. This was the natural result of a mutual urgency appeal among men in the fire service of the public to form an organization for their mutual benefit and education. Their motto "For Unity of Thought and Action" expresses the purpose of the Organization. Membership is open only to those in the employ of some rural or mountain Fire Prevention Agency of Southern California. Its membership totaling approximately 120 paid-up members, includes U. S. F. S. Officers, County Fire Wardens and State Fire Rangers.

In southern California there are four National Forests—three counties with their own fire organization and seven counties under the jurisdiction of State Fire Rangers. Already these groups have been drawn closer together in cooperative Fire Prevention and Control Agreement; also by holding quarterly Directors meetings, and their big annual meetings, the men in the work have a chance to get together, talk over mutual problems, and bring in outside experts to give talks to broaden their view point.

WINTER TRAFFIC COUNT ON STATE HIGHWAYS

(Continued from page 25.)

WINTER TRAFFIC COUNT ON STATE HIGHWAYS					January, 1930		January, 1931		
					Sun.	Mon.	Sun.	Mon.	
					12	13	11	12	
(Continued from page 25.)									
Station location	Jan. 12	Jan. 13	Jan. 11	Jan. 12	Station location				
Dyersville at Jc. C.R. to South Fork, S. on 1.....	394	313	540	520	W. on C.R.	54	127	146	104
E. on C.R.	115	177	180	290	S. on 2.....	1,079	1,066	978	823
N. on 1.....	258	212	500	510	Paso Robles N. of Cy. Lts.	1,164	1,263	1,900	1,600
W. on C.R.	10	26	60	50	Paso Robles S. of Cy. Lts.	1,581	1,850	2,200	1,500
Fernbridge at Jc. C.R. to Ferndale, S. on 1.....	788	524	2,309	1,312	San Luis Obispo S. of Cy. Lts.	1,916	1,726	2,190	1,800
W. on C.R.	402	238	1,166	786	San Luis Obispo S. of Cy. Lts. at R. R. Xing.....	2,650	2,768	3,900	2,800
N. on 1.....	747	496	2,218	1,319	Santa Maria N. of Cy. at Jc. R. 57 to Bakersfield.....	1,827	1,929	2,790	1,800
Eureka S. of Cy. Lts.	2,329	1,773	3,270	2,390	N. on 2.....	201	70	260	120
Eureka N. at Eureka Slough Bridge	2,230	1,665	3,069	2,370	E. on 57.....	2,073	1,981	2,900	1,900
Arcata N. of Cy. at Jc. Rt. 20 to Weaverville.....	1,243	734	2,210	1,399	1 Mi. S. of Zaca Jc. Los Olivos Rd., N. on 2.....	1,291	1,329	1,100	1,200
E. on 20.....	563	360	870	700	E. on C.R.	210	245	520	650
N. on 1.....	726	385	1,420	710	W. on C.R.	208	256	520	480
Orick Jc. Rt. 1 and C.R. to Weitch- pes.....	183	149	400	290	S. on 2.....	1,325	1,435	1,300	1,500
E. on C.R.	21	10	30	40	Garfield W. on Rd. to Garfield Sta.. Orella, opposite Orella Sta.....	1,407	1,431	1,900	1,000
N. on 1.....	169	138	280	260	Santa Barbara W. of Cy. at Jc. San Marcos Rd., N. on 2.....	3,218	3,731	4,200	3,500
Klamath Bridge.....	194	129	350	270	On San Marcos Rd.	1,049	571	940	570
Crescent Cy. S.E. of Cy. at Jc. Rd. to Crescent Cy., S. on 1.....	467	429	563	634	S. on 2.....	3,694	3,880	4,900	3,800
N. to C. of Cy. at 10th Ave.....	819	631	1,939	845	Santa Barbara S. of Cy. Lts. on 2.. Santa Barbara 300 Ft. E. of Cy. Lts. Santa Barbara-Ventura Co. Line.....	4,871	5,685	6,600	5,700
E. on 1.....	522	329	711	412	3,191	3,154	5,600	3,100	
Houche Bridge, C.R. to Smith River S. on 1.....	306	139	360	190	District VII				
W. on C.R.	50	50	50	50	Ventura W. of Cy. at Bridge.....	2,378	3,523	6,600	3,800
N. on 1.....	76	41	120	80	Ventura E. of Cy. Lts.	4,263	5,102	7,600	5,500
Oregon Line.....	76	41	120	80	El Rio Intersection, N. on 2.....	3,703	4,134	6,900	4,100
Route 2. San Francisco to San Diego					N. to Salicy.....	912	1,133	1,200	1,000
District IV					S. on 60.....	2,860	3,616	6,200	3,800
Colma Jc. with road to S. San Fran- cisco, N. on 2.....	14,893	7,695	22,000	8,200	E. on 2.....	1,970	1,949	3,000	2,100
E. on C.R.	2,133	1,737	4,100	1,900	Ventura-Los Angeles Co. Line.....	2,111	1,797	3,300	1,900
N. on 2.....	12,764	5,956	18,000	6,400	W. of Hellsburg-Ventura Blvd. at Seppelts St. L. A. E. at Indiana St. Whittier at Jc. with Hadley St. W. on 2.....	4,628	5,368	10,400	5,200
San Bruno Jc. with Bay Shore Rd. to S. San Francisco, N.W. on 2.....	11,743	5,533	17,000	6,200	11,619	14,612	14,300	12,200	
N.E. on C.R.	1,712	2,027	2,900	2,300	N. on Hadley.....	2,800	3,894	3,900	4,300
S. on 2.....	13,455	7,562	20,000	8,400	E. on 2.....	9,185	8,947	12,100	9,100
San Mateo S. of Cy. at 10th Ave.....	11,849	9,889	22,000	12,000	La Habra E. Cy. Lts. at Jc. Rds. to La Habra and Brea, N. on 2.....	3,824	3,141	8,100	4,600
Redwood City N. of Cy. Lts.	12,661	8,666	20,000	10,600	W. to La Habra.....	2,334	2,257	4,100	2,800
Palo Alto at Federal Telegraph Sta- tion.....	9,533	7,044	15,484	7,523	E. of Brea.....	2,334	2,257	4,000	2,700
9 Mi. N. of San Jose on Rt. 2, N. on 2.....	3,938	6,272	8,200	5,300	S. on 2.....	3,344	3,962	8,800	5,900
W. on C.R.	1,290	1,085	2,300	1,500	Anahelm N. of Cy. Lts.	7,131	8,881	19,400	9,000
S. on 2.....	7,242	6,333	19,000	6,100	Santa Ana N. of Cy. Lts. at Jc. C.R. to Orange.....	5,804	6,697	5,200	3,100
5 Mi. N. of San Jose.....	6,693	5,873	9,300	6,800	E. on C.R.	4,560	4,796	5,300	6,000
4 Mi. N. of San Jose.....	8,290	5,238	9,800	8,500	S. on 2.....	6,756	8,142	5,300	4,800
San Jose N. of Cy. Lts. at Lumber Yard.....	14,370	20,760	17,300	20,600	Tustin W. of Cy.....	3,562	4,390	6,200	5,700
San Jose S. of Cy. Lts.	5,015	5,806	8,200	6,300	Serra Jc. Rt. 60, N. on 2.....	1,971	1,697	3,400	1,800
5 Mi. S. of San Jose.....	3,563	3,175	5,600	3,600	W. on 60.....	1,895	1,873	4,100	2,700
10 Mi. S. of San Jose.....	3,713	3,151	4,800	4,900	S. on 2.....	3,440	2,902	5,700	2,700
15 Mi. S. of San Jose.....	3,621	3,223	5,800	2,500	Oceanside N. S. Cy. Lts.	2,977	3,508	6,900	4,100
Gilroy N. of Cy. at Jc. with Mt. Madonna Rd. to Watsonville, N. on 2.....	4,443	4,654	6,800	4,700	Deloar at S.P. R.R. Xing.....	3,354	2,590	5,600	2,800
W. on C.R.	750	727	1,300	800	Route 3. Sacramento to Oregon Line				
S. on 2.....	4,531	4,671	7,000	4,800	District III				
District V					Sacramento N. at Jc. Garden Highway, W. on 3.....	9,288	9,723	14,380	13,000
San Juan Bautista N. of Cy. at Jc. with R. 67 Chittenden Rd., S. on 2.....	2,589	2,199	2,800	1,800	N. on Garden Highway.....	607	724	2,650	2,100
W. on 67.....	1,404	1,051	1,200	850	E. on 3.....	8,931	9,392	11,329	11,000
S. on 2.....	2,225	2,009	2,600	1,700	Ben All Xing Jc. C.R., W. on 3.....	4,972	3,383	5,623	3,800
San Juan Bautista S. of Cy. at Jc. R. 22 to Hollister, N. on 2.....	2,431	2,160	3,300	2,400	N. on C.R.	374	224	560	360
E. on 22.....	1,191	1,333	1,500	1,200	S. on C.R.	373	683	820	700
S. on 2.....	2,057	1,663	2,500	1,800	E. on 3.....	5,318	2,814	5,250	3,100
S. Mt.-Mon. Co. Line.....	1,867	1,627	2,300	1,500	Jc. C.R. to Folsom N. of 12 Mi. House, S. on 3.....	4,440	2,621	4,412	2,774
Sallinas N. of Cy. Lts.	2,936	3,151	5,300	3,900	E. on C.R.	407	218	656	340
Sallinas S. of Cy. Lts.	2,147	2,610	3,200	3,100	N. on 3.....	4,733	2,131	3,779	2,537
Gonzales 3 Mi. W. of Town.....	1,628	1,722	2,200	1,900	Roseville S. of Cy. Lts.	5,149	2,725	5,530	3,600
Solaced S. of Milk Plant.....	1,585	1,731	2,400	1,700	Roseville N. of Cy. Lts.	1,246	1,297	1,560	1,000
San Lucas S. of Cy. at Jc. R. 10 to Calinga and C.R. to Jolon, N. on 2.....	1,151	1,155	1,095	873	Marysville S. of Cy. at Jc. Ham- mondon Rd., S. on 3.....	1,064	1,619	1,840	1,400
E. on 10.....	75	93	116	85	Ham. Rd.	423	602	730	820
					N. on 3.....	1,570	1,798	3,116	2,200
					W. on C.R.	253	339	830	580

	January, 1930		January, 1931			January, 1930		January, 1931	
Station location	Sun.	Mon.	Sun.	Mon.	Station location	Sun.	Mon.	Sun.	Mon.
	12	13	11	12		12	13	11	12
Yuba Cy. N. of Cy. at Je. Rt. 15,					E. on 13.....	194	171	550	280
S. on 3.....	2,102	2,533	3,350	3,100	S. on 4.....	2,774	2,723	4,100	3,260
W. on 15.....	1,187	1,405	1,860	1,500	Modesto N. of City.....	3,855	4,499	5,500	4,800
N. on 3.....	1,396	1,647	2,130	2,000	Modesto S. of Cy. Jc. Crows Land- ing Rd.,				
Richvale Wye Jc. Rt. 21 to Oroville,					N. on 4.....	5,948	7,351	6,900	7,000
S. on 3.....	709	574	970	690	S. on 4.....	2,957	5,947	5,000	5,300
W. on 2.....	586	521	960	640	W. on C.R.....	1,829	2,759	2,700	3,100
E. on 21.....	349	291	470	340	Turlock N. of City.....	2,739	3,088	4,100	3,700
Chico at Jc. C.R. east to De Sabla,					Turlock S. of City.....	2,568	2,676	3,700	3,200
S. on 3.....	1,580	1,386	2,670	2,200					
E. on C.R.....	185	135	410	260					
N. on 3.....	1,719	1,493	2,940	2,300					
Chico N. of Cy. at Jc. C.R. East,					District VI				
S. on 3.....	981	1,004	1,730	1,800	Stanislaus-Mer-Co. Line.....	2,064	2,448	2,100	2,600
E. on C.R.....	141	112	180	270	Atwater N. of Co.....	1,916	2,101	2,700	2,400
N. on 3.....	883	953	1,610	1,600	Merced N. of Cy. Lts. at Bridge.....	2,694	3,253	2,500	3,400
					Merced S. Cy. Lts. at Bridge.....	2,036	2,501	2,100	3,300
					Merced-Madera Co. Line.....	1,337	1,297	1,800	1,600
District II					Califa Jc. Rt. 32 to Gilroy,				
Butte-Tehama Co. Line.....	346	352	700	650	N. on 1.....	1,390	1,515	2,100	1,800
Red Bluff at Jc. with Rt. 29 to Suzanneville,					W. on 32.....	481	470	320	150
S. on 2.....	767	851	1,510	1,300	S. on 4.....	1,652	1,748	2,000	1,600
E. on 29.....	317	287	940	580	Madera N. of City.....	2,252	2,806	3,500	3,300
N. on 2.....	629	826	1,390	1,370	Madera-Fresno Co. Line.....	2,379	2,509	3,100	2,900
Cottonwood S. of Town at Tehama Shasta Co. Line.....	742	743	1,210	950	Fresno N. of Cy. W. of S. P. R. R. Xing at Jc. Olive Ave.,			4,000	4,200
Redding S. of Cy. at Jc. Rt. 28 to Alturas,					N. on 4.....	3,242	4,143	4,600	5,000
S. on 3.....	832	830	1,370	1,920	E. on Olive.....	1,342	817	1,500	1,000
E. on 23.....	269	285	710	730	S. on 4.....	3,362	4,250	4,200	4,300
N. on 3.....	1,100	1,081	1,950	2,500	W. on Olive.....	810	624	1,100	610
Redding 3 Mi. N. at Jc. with C.R. to Kennett,					Fresno S. of Cy. at Jc. Church Ave. on 4.....	5,946	8,095	8,362	9,019
S. on 3.....	215	116	540	460	Maine S. of R. R. Sta.....	4,173	5,383	5,400	7,000
W. on C.R.....	11	17	30	10	Powder S. of City.....	2,608	3,113	4,000	4,200
N. on 3.....	186	129	550	460	Selma S. of City.....	2,470	2,962	3,600	3,300
Gibson-Boulder Creek Maint. Yard, Dunsuir 1.5 Mi. S.	454	506	492	473	Kingsburg S. of City Nr. Kings River Bridge.....	1,765	2,151	3,200	2,400
Dunsuir N. Cy. Lts. at Br.....	810	718	1,350	1,340	Goshen Jc., Rt. 10 to Hanford and Visalia,				
Dunsuir 4 Mi. N. at Mott.....	553	472	790	610	N. on 4.....	1,705	1,911	2,800	2,200
Gazelle 1 Mi. N.....	485	437	800	580	W. on 10.....	1,614	923	1,200	940
Yreka, S. Cy. Lts.....	932	789	1,490	1,110	S. on 4.....	1,397	1,594	2,600	2,000
Jc. with Rt. 46 S. of Hornbrook,					E. on 4.....	1,310	1,365	1,500	1,500
S. on 3.....	382	305	890	700	Visalia Wye, Jc. Rt. 10 to Visalia,	1,845	2,074	2,400	2,

Station location	January, 1930		January, 1931	
	Sun. 12	Mon. 13	Sun. 11	Mon. 12
Saugas at Jc. Rt. 23 to Mojave,				
N. on 4.....	3,100	1,696	3,700	850
E. on 23.....	7,677	2,051	7,300	1,690
S. on 4.....	9,943	3,626	8,400	2,300
Near Newhall at S. end of Sec.				
LA-4-E.....	10,476	3,748	9,164	2,271

Route 5. Stockton to Santa Cruz via Oakland

District X				
French Camp,				
N. on 4.....	1,787	1,994		
S.W. on 5.....	1,560	1,630		
S.E. on C.R.....	276	411		
Jc. Old Rt. 4 N. of French Camp				
R. R. Xing.....			3,200	2,800
N. on 5.....			3,000	2,500
N.W. on C.R.....			550	480
S.E. on C.R.....			870	860
Mossdale Jc. Rt. 66 to Manteca,				
N. on 5.....	1,986	1,837	2,730	1,900
E. on 66.....	1,855	1,537	2,687	1,524
S. on 5.....	3,839	3,222	2,265	3,435
Tracy W. of Cy. at Jc. C.R. to				
Byron Sta.....				
E. on 5.....	3,619	2,744	4,800	2,800
N. on C.R.....	356	401	580	350
W. on 5.....	3,313	2,303	4,200	2,400

District IV

Altamont at R.R. Sta.....	3,501	2,292	4,700	2,600
Livermore E. of Cy. at Jc. C.R. to				
Livermore.....				
E. on 5.....	3,409	2,687	5,300	3,600
S. on C.R.....	1,927	985	2,100	1,100
W. on 5.....	2,533	1,728	3,200	1,900
Santa Rita Inn Jc. C.R. to Pleasant-				
on.....				
E. on 5.....	3,934	2,240	5,300	2,600
S. on C.R.....	695	486	870	600
W. on 5.....	4,367	2,459	5,600	2,800
Dublin Jc. C. R. to Martinez,				
E. on 5.....	4,491	2,383	5,700	3,100
N. on C.R.....	1,691	578	1,700	540
W. on 5.....	5,223	2,501	6,200	3,200
Dublin Jc. C. R. to Niles,				
E. on 5.....	5,177	2,612	6,200	3,000
S. on C.R.....	631	258	1,100	390
W. on 5.....	5,225	2,608	6,300	3,100
Hayward Jc. with Castro Valley				
Road.....				
E. on 5.....	5,947	3,205	8,400	4,400
N.W. to Castro Valley.....	1,331	1,168	1,900	1,300
S.W. on 5.....	4,515	2,101	6,420	3,600
At Alameda Co. Hospital.....	6,189	2,731	7,900	3,600
Hayward, S. of Cy. Lts.....	3,262	2,526	7,400	3,900
Niles N. at Hotel Belvoir.....	2,535	2,158	6,100	2,700
Niles at Jc. Niles Canyon Road,				
N. on 5.....	3,363	3,014	6,100	3,100
E. on C.R.....	1,009	1,030	1,500	840
S. on 5.....	3,078	2,740	5,700	2,900
Niles S. of Cy. at Jc. C.R. to Cent-				
erville.....				
N. on 5.....	2,762	2,228	5,000	2,800
W. on C.R.....	1,144	1,390	1,700	1,500
S. on 5.....	1,851	1,161	4,200	1,600
Mission San Jose Jc. C.R. to Liver-				
more.....				
N. on 5.....	1,654	912	3,000	1,300
E. on C.R.....	1,080	785	1,700	800
S. on 5.....	469	1,599	5,100	1,900
9 Mi. N. of San Jose Jc. C.R. to				
Centerville.....				
N. on 5.....	2,061	1,137	4,000	1,500
N.W. on C.R.....	3,446	1,960	3,800	1,800
S. on 5.....	5,502	3,099	7,800	3,300
5 Mi. N. of San Jose.....	6,434	4,226	10,000	4,500
San Jose N. of Cy. at Jc. with Gish				
Road.....	4,257	3,631	6,500	3,900
San Jose W. of City at Sanitarium				
Los Gatos N. of City.....	6,121	5,171	11,000	11,200
Los Gatos S. of City Lts.....	1,890	1,832	3,200	2,600
Santa Clara-Santa Cruz Co. Line.....	2,134	1,533	3,900	2,200
Santa Cruz N. of City.....	1,910	718	2,600	900
	1,371	1,074	2,600	1,800

Route 6. Sacramento to Woodland Junction

District X				
West of Sacramento, W. of Under-				
pass.....	3,011	3,078	4,800	4,200
Davis E. of Cy. Underpass.....	2,810	2,744	4,000	3,400
Woodland Wye Jc. Rt. 7 W. to				
Benicia and N. to Woodland,				
E. on 6.....	2,633	2,767	3,900	3,100

Station location	January, 1930		January, 1931	
	Sun. 12	Mon. 13	Sun. 11	Mon. 12
W. on 7.....	2,320	2,103	3,200	2,500
N. on 7.....	1,881	1,709	2,000	1,500

Route 7. Tehama Junction to Benicia

District X				
Benicia N. of City.....	822	326	490	290
Cordelia Jc. Rt. 8 to Napa,				
S. on 7.....	235	208	210	190
W. on 8.....	2,290	1,459	2,800	1,800
E. on 7.....	2,471	1,653	2,900	2,000
West of Cordelia, Old Jc. Rts. 7				
and 8.....				
S. on 7.....			470	300
E. on C.R.....			500	220
N. on 7.....			630	170
Cordelia Jc. C.R. to Suisun,				
W. on 7.....	438	330		
E. on C.R.....	447	348		
N. on 7.....	276	219		
Fairfield E. of City.....	2,886	2,005	3,000	2,500
Dixon S. of City.....	2,308	1,836	2,800	2,000
Woodland Wye Jc. Rt. 6,				
W. on 7.....	2,320	2,103	3,200	2,500
E. on 6.....	2,633	2,707	3,000	3,100
N. on 7.....	1,881	1,709	2,000	1,500

District III

Woodland S. of City.....	1,802	1,802	2,010	1,700
Woodland N. of Cy. at Brown's				
Corner Jc. with C.R. W. & S.,				
E. on 7.....	2,079	1,947	2,940	2,100
S. on C.R.....	231	179	340	210
W. on C.R.....	708	813	1,400	950
N. on 7.....	1,468	1,189	1,900	1,300
Williams S. of City.....	1,180	867	1,700	1,200
Williams N. of City.....	847	678	1,600	1,400
Willows S. of City.....	1,057	978	1,250	1,000
Willows N. of City at Maint. Sta.	1,560	1,240	1,640	1,500
Orland N. of City.....	826	832	1,350	1,200

District II

Red Bluff, S. of town at Reed Creek				
Bridge.....	935	870	1,040	1,000

Route 8. Ignacio to Cordelia via Napa

District IV				
Petaluma Creek Bridge.....	941	432	1,780	650
Schellville Jc. Rt. 51 to Santa Rosa,				
S.W. on 8.....	1,117	581	1,600	850
N. on 51.....	724	411	900	500
N.E. on 8.....	792	464	1,200	540
Jc. Rt. 8 and C.R. to Vineburg,				
W. on 8.....			1,100	500
E. on 8.....			2,000	970
N. on C.R.....			1,100	570
Napa Wye Jc. C.R. to Vallejo,				
N. on 8.....	3,407	2,291	4,500	2,100
S. on C.R.....	4,693	2,804	5,700	3,100
E. on 8.....	3,093	2,178	3,500	2,100

District X

Cordelia Jc. Rt. 7.....	2,290	1,459	2,800	1,800
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Route 9. District VII

Tujunga W. of Sunset Blvd.....	6,152	3,081	6,800	3,200
La Crescenta W. of Penn. Ave.....	9,847	3,826	8,200	4,800
La Canada at School St.....	5,296	3,472	8,600	4,800
Pasadena E. of Cy. Lts.....	10,553	7,140	17,600	8,200
Azusa W. of City Limits.....	11,173	5,533	21,600	6,400

District VIII

S. Rd.-L. A. Co. Line.....	12,973	3,029	18,600	3,700
Uplands E. of Cy. at Jc. C.R. to				
Uplands.....				
W. on 9.....	4,738	1,712	8,800	2,600
S.W. on C.R.....	1,431	1,294	1,300	1,600
E. on 9.....	5,942	2,883	10,100	4,200
Uplands at Euclid Ave Inter-				
section.....				
W. on 9.....	7,116	2,619	5,971	2,401
N. on Euclid Ave.....	6,613	2,678	6,538	1,885
S. on Euclid Ave.....	4,299	2,432	3,676	2,106
E. on 9.....	6,019	2,230	11,533	2,332
S. Bd. W. of City.....	5,790	3,836	10,300	4,600

Route 10. San Lucas to Sequoia National Park

District VII				
San Lucas S. of City at Jc. Rt. 2.....	75	92	116	95

District VI

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Monterey-Fresno Co. Line.....	139	43	80	30
Parkfield Jc.,				
W. on 10.....	297	76	150	70
S. on C.R.....	48	42	30	30
E. on 10.....	264	105	180	90
Coalinga S. of City.....	572	365	500	420
Coalinga 3 Mi. E. at Jc. C.R. to Oilfields.....				
W. on 10.....	784	1,056	870	969
N. on C.R.....	207	254	230	300
E. on 10.....	576	802	630	660
Oilfields at Oil King School,				
W. on 10.....	464	424	840	970
N. on C.R.....	199	209	400	560
E. on 10.....	329	284	410	460
Kings River Bridge.....	348	548	370	260
Lemoore Jc. C.R. to Lemoore,				
N. on 10.....	447	562	630	500
E. on C.R.....	431	459	500	450
S. on 10.....	426	406	430	420
Hanford W. of Cy. Lts.....	1,280	1,904	1,200	1,200
Hanford E. of Cy. at Interx. C.R. N. to Kingsburg & S. to Corcoran,				
W. on 10.....	2,421	2,448	3,500	2,500
N. on C.R.....	1,295	1,382	1,500	1,400
S. on C.R.....	1,371	1,437	2,000	1,600
E. on 10.....	1,737	1,970	2,200	2,000
Goshen, Jc. Rt. 4,				
W. on 10.....	1,044	923	1,200	940
N. on 4.....	1,705	1,941	2,800	2,200
S. on 4.....	1,597	1,594	2,600	2,000
E. on 4.....	1,310	1,365	1,500	1,500
Visalia Wye, Jc. Rt. 4 W. to Goshen & S. to Bakersfield and Rt. 10 E. to Visalia,				
W. on 4.....	1,845	2,074	2,400	2,200
S. on C.R.....	1,272	1,410	1,400	1,500
E. on 10.....	2,296	3,293	3,400	3,300
Visalia E. to Cy. at Exeter Jc.,				
W. on 10.....	1,791	1,834	2,000	2,400
S. to Exeter.....	970	1,073	850	980
E. on 10.....	1,091	975	1,800	2,100
Lemon Core Jc. C.R. to Woodlake,				
W. on 10.....	1,032	426	690	440
N. on C.R.....	723	274	430	290
E. on 10.....	1,508	427	890	490
Three Rivers E. of Town at Jc. C.R. northerly,				
W. on 10.....	1,308	231	720	290
N. on C.R.....	61	62	170	110
E. on 10.....	1,521	231	700	280

Route 14. Sacramento to Nevada Line via Placerville

District III

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Sacramento E. of Cy. Lts.....	2,855	1,932	3,820	3,300
Perkins Jc. with C.R. to Plymouth,				
W. on 11.....	2,225	1,694	3,710	3,100
S.E. on C.R.....	1,046	804	1,610	1,300
E. on 11.....	2,442	1,063	2,630	2,230
Folsom W. of Cy. Jc. Pratt Road,				
W. on 11.....	1,501	759	1,460	940
E. on C.R.....	360	200	450	300
E. on 11.....	1,187	612	1,090	700
Folsom E. of Cy. at High School,				
W. on 11.....	1,115	335	1,140	590
N. on C.R.....	308	132	250	160
E. on 11.....	1,353	421	1,140	610
El Dorado Jc. Rt. 65,				
W. on 11.....	921	378	460	550
S. on 65.....	56	54	130	260
E. on 11.....	876	358	950	560
Placerville W. of Cy.....	1,160	1,064	1,330	860
Placerville E. of Cy.....	720	519	1,560	700
Headquarters Camp.....	101	40	2,220	250
Between Riverton and Kyburz.....	24	14		
Alpine Jc.,				
W. on 11.....	Road closed	Road closed	Road closed	
S. on 23.....	Road closed	Road closed	Road closed	
E. on 11.....	Road closed	Road closed	Road closed	
Jc. Rt. 38 to Lake Tahoe,				
W. on 11.....	Road closed	Road closed	Road closed	
N. on 38.....	Road closed	Road closed	Road closed	
E. on 11.....	Road closed	Road closed	Road closed	
Lakeville at Connelley Ser. Sta. Jc. C.R. to Bigon,				
W. on 11.....	Road closed	Road closed	Road closed	
N. on C.R.....	Road closed	Road closed	Road closed	
E. on 11.....	Road closed	Road closed	Road closed	

Route 12. San Diego to El Centro

District VII

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
San Diego E. of City Euclid Ave. at Cajon Ave.....	6,978	3,781	10,000	5,300
El Cajon W. of Cy. Lts.....	5,020	2,811	7,400	5,200
At Sweetwater Bridge.....	3,481	427	2,500	850
Jacumba at Jc. C.R. El Campo,				
W. on 12.....	Road closed		1,200	600
S. on C.R.....	736	417	250	100
E. on 12.....	1,691	410	1,300	680
On Imp.-12-R.....	No report, snow		1,200	630
El Centro W. of Cy. at Jc. Rt. 26 to S. Rd.,				
W. on 12.....	2,901	2,158	3,569	3,821
N. on 26.....	4,598	4,563	5,976	5,699
E. on Mulberry Lane.....	2,377	2,752	2,949	3,473
S. from Intersection.....	5,078	4,494	6,671	5,651

District VIII

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
On Imp.-12-R.....	No report, snow		1,200	630
El Centro W. of Cy. at Jc. Rt. 26 to S. Rd.,				
W. on 12.....	2,901	2,158	3,569	3,821
N. on 26.....	4,598	4,563	5,976	5,699
E. on Mulberry Lane.....	2,377	2,752	2,949	3,473
S. from Intersection.....	5,078	4,494	6,671	5,651

Route 13. Salida to Route 23 at Junction

District X

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Salida Jc. Rt. 4.....	194	171	550	390
E. of Salida at McHenry's Jc. C.R. to Modesto,				
W. on 13.....	311	348	480	350
S. on C.R.....	1,484	1,442	1,800	1,500
N. on 13.....	1,503	1,483	1,900	2,500
Oakdale W. of Cy.....	1,370	1,316	1,500	1,500
E. of Oakdale.....	1,750	732	2,100	950
Mountain Pass Jc. Rt. 40 to Yosemite,				
S.W. on 13.....	1,211	295	1,800	400
S.E. on 40.....	157	60	100	70
N. on 13.....	1,127	233	1,700	370
Sonora S. of City.....	1,736	1,029	3,600	1,900
Sonora E. at Sullivan Creek Bridge,				
E. on C.R.....	335	347	580	710
N. on 13.....	823	365	2,100	620
W. on 13.....	1,046	630	1,900	1,100
Jc. S.H. & C.R. at Pooleys,				
W. on 13.....	898	185	2,600	430
S. on C.R.....	990	254	2,900	480
N. on 13.....	245	93	540	180
Between Confidence and Bakers Sta.	Road closed		Road closed	

District IX

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Jc. Rt. 23.....	Road closed		Road closed	

Route 14. Albany to Martinez

District IV

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Albany at County Line.....	14,666	12,259	19,000	13,000
Jc. C.R. to Richmond,				
S. on 14.....	13,210	10,931	18,000	12,700
W. on C.R.....	3,901	4,115	5,400	5,300
N. on 14.....	9,815	7,050	13,000	8,200
Jc. Franklin Canyon Rd.,				
S. on 14.....	5,474	3,953	7,600	4,400
E. on C.R.....	1,605	1,170	2,400	1,200
N. on 14.....	4,254	2,986	5,500	3,500
Carquinez Straits Bridge.....	3,116	2,054	4,139	2,455
Crockett 1 Mi. S. at Jc. C.R. to Crockett,				
W. on 14.....	791	907	1,900	1,000
S. on C.R.....	637	938	1,200	1,400
N. on 14.....	788	831	1,800	1,300
Martinez W. of Cy Lts.....	550	358	790	390

Route 15. Route 1 Near Calpella to Route 37 Near Cisco

District IV

Station location	January, 1930 Sun. 12	1930 Mon. 13	January, 1931 Sun. 11	1931 Mon. 12
Ukiah N. at Jc. Rt. 1.....	377	311	670	490
Upper Lake, S. of Cy. Jc. C.R. to Lakeport,				
W. on 15.....	310	236	630	600
S. on C.R.....	163	179	440	470
N. on 15.....	380	399	750	610
Jc. C.R. and Lakeport Cut-off,				
W. on 15.....			240	170
E. on 15.....			520	330
Upper Lake, Jc. C.R. to Bartlett Springs,				
N. on 15.....	128	153	460	250
E. on C.R.....	6	0	40	10
S. on 15.....	122	153	470	240
Lower Lake Jc. $\frac{1}{2}$ Mi. W. Sweet Hollow Summit,				
E. on 15.....	95	103	120	70

Station location	January, 1930		January, 1931		Station location	January, 1930		January, 1931	
	Sun.	Mon.	Sun.	Mon.		Sun.	Mon.	Sun.	Mon.
S. on 49.....	36	40	150	152	Los Angeles Co. Line E. City Limits				
W. on 13.....	79	105	170	180	Pomona, New Road.....	2,427	2,488	4,200	3,700
Near Venada Jc. C.R. to Bartlett Springs.....					Bet. Pomona & Ontario at Chino Cross Roads.....				
W. on 15.....	37	36	150	110	N. on C.R.....	824	788	180	140
S. on C.R.....	13	6	49	60	S. on C.R.....	380	927	490	420
E. on 15.....	62	45	160	180	E. on 19.....	1,849	1,743	3,500	2,700
Williams W. of Cy.....	329	314	380	420	W. on 19.....	2,174	1,931	3,900	3,200
Williams E. of Cy.....	468	423	600	550	East of Ontario, E. Cy. Lts. at Jc. of New S. Bd.-19-B, with Old Road.....				
Colusa E. of Cy.....	559	689	1,140	650	W. on 19, New Road.....	650	470	2,000	1,500
Sutter City.....					E. on 19, New Road.....	420	389	5,100	3,000
W. on 15.....	616	667	960	770					
N. on C.R.....	314	166	390	220					
E. on C.R.....	309	498	350	530					
S. on 15.....	671	699	1,020	730					
Marysville E. of Cy.....	571	466	1,040	530					
Smartsville N. of Jc. N. & S. Side Road.....									
E. on 15.....	169	46	540	120					
W. on side road.....	35	14	90	60					
W. on 15.....	291	57	570	120					
Grass Valley W. of Cy.....	233	121	700	280					
Nevada City E. of Cy.....	190	60	1,680	120					

Route 16. Hopland to Lakeport				
District IV				
Hopland at Jc. Rt. 1.....	405	362	610	390
Lakeport S. of Town at Jc. C.R. to Kelseyville.....				
N.E. on 16.....	430	459	1,000	860
S. on C.R.....	415	438	800	750
W. on 16.....	99	49	309	280

Route 17. Roseville to Nevada City				
District III				
Roseville E. of Cy.....	4,071	1,256	3,710	1,700
Auburn S. of Cy. Jc. Ophir Rd.....	1,977	602	2,640	800
E. on 17.....	45	91	180	210
N. on C.R.....	2,184	623	1,009	860
W. on 17.....				
Auburn N. of Cy. Jc. Country Club Road.....				
N. on 17.....	762	189	1,300	620
E. on C.R.....	20	31	140	70
S. on 17.....	799	198	1,380	660
Grass Valley S. of City.....	1,283	305	1,780	750
Nevada City S. of City.....	512	422	2,250	920

Route 18. Merced to Route 40 Near Sequia				
District VI				
Merced 1.6 Mi. E. at Interx. C.R. at 21st St.....				
W. on 18.....	1,195	1,010	1,300	1,500
E. on 18.....	1,488	1,422	1,500	1,500
W. on C.R.....	354	414	1,000	2,100
Merced 12 Mi. E. at Interx. C.R. to Le Grand.....				
W. on 18.....	739	177	530	370
S. on C.R.....	50	26	30	150
E. on 18.....	761	174	550	360
Mormon Bar at Interx. with C.R. to Mormon Bar.....				
S. on 18.....	714	206	1,690	490
E. on C.R.....	14	19	120	110
S. on 18.....	657	188	1,710	480
Briegburg to Bear Creek Bridge on 18.....	471	100	850	170
El Portal Jc. County Road.....				
W. on 18.....	546	184	1,200	200
E. on C.R.....	87	75	230	110
W. on 18.....	539	156	1,100	170

Route 19. From Route 9 West of Claremont to Riverside				
District VIII				
Los Angeles Co. Line E. Cy. Lts. Pomona—Old Road.....	9,560	6,053	15,000	6,900
Bet. Pomona & Ontario at Chino Cross Rds.....				
W. on 19, Old Road.....	9,649	5,950	12,800	6,090
N. on C.R., Old Road.....	113	81	190	100
S. on C.R. to Chino, Old Road.....	459	563	590	750
E. on 19, Old Road.....	9,739	6,138	12,600	6,200
East of Ontario, E. Cy. Lts. at Jc. of New S. Bd.-19-B with Old Road.....				
N.W. on 19, Old Road.....	1,991	1,645	3,400	1,800
At S. Rd.-Riv. Co. Line on 19, Old Road.....	2,063	1,957	4,800	2,600
Wineville E. of Cy., Old Road.....	2,857	2,211	10,400	5,500
Riverside W. of Cy. at Santa Ana River Bridge, Old Road.....	4,490	4,450	7,800	5,400

Route 20. Route 1 Near Arcata to Redding via Weaverville				
District I				
Arcata N. of Cy. at Jc. Rt. 1.....	563	360	870	700
Willow Creek Jc. C.R. to Hoopa.....				
W. on 20.....	25	18	70	80
N. on C.R.....	37	37	60	80
E. on 20.....	27	27	70	70
Humboldt-Trinity Co. Line.....	42	59	100	210

District II				
Big Bar Vicinity.....	14	12	60	70
Weaverville, 3 Mi. S.....	45	40	110	190
Bet. Redding & Tower House.....	62	66	320	360

Route 21. Route 3 Near Richvale to Quincy				
District III				
Richvale Wye.....	349	241	470	340
Oroville W. Jc. Marysville Road.....				
E. on 21.....	1,054	1,120	1,810	1,500
W. on 21.....	644	723	1,200	1,100
S. on Marysville Road.....	429	457	810	470
Oroville E. of Cy.....	954	827	1,570	1,400
River Road.....			420	180
Feather River Br.....			320	50
Miners Ranch.....				
E. on 21.....	155	60	240	110
S. on C.R.....	246	99	160	200
W. on 21.....	395	171	360	270
Bidwell Bar Bridge.....	45	35	190	120
Berry Creek.....	9	4	180	60
Meadow Valley.....				
W. on 21.....	25	11	20	30
E. on 21.....	25	11	40	30
N. on C.R.....	6		40	30
Quincy.....	40	20	50	50

Route 22. San Juan Bautista to Route 32 Via Hollister				
District V				
San Juan Bautista S. of Cy. at Jc. Rt. 2.....	2,431	2,160	1,500	1,200

District IV				
Hollister, Jc. Rt. 32.....	707	334	460	330

Route 23. Saugus to Route 11 at Alpine Junction				
District VII				
Saugus Jc. with Rt. 4.....	7,677	2,051	7,300	1,600
Palmdale S. of Cy. Lts.....	2,818	996	5,200	1,000
Lancaster Jc. with Rt. 59 to Needac, N. on 23.....	1,322	1,106	3,000	1,900
W. on 23.....	450	529	1,200	1,000
N. on 23.....	962	686	1,900	900
Los Angeles-Kern Co. Line.....	631	362	1,300	530

Route 23. District IX				
Mojave Jc. Rts. 58 and 23.....				
S. on 23.....	505	206	350	410
E. on 23.....	47	92	170	170
N. on 23.....	545	381	630	550
Mojave Jc. C.R. to Bakersfield.....				
N. on 23.....	542	270	560	300
N.W. on C.R.....	430	189	420	350
N. on 23.....	126	95	400	650
Freeman 1 Mi. N. Jc. to Rt. 57.....				
S. on 23.....	43	20	220	60
E. on 23.....	51			
N. on 23.....	51		220	100
Kern-Inyo Co. Line.....	21	31	179	150
Olancha Jc. C.R. to Keeler.....				
S. on 23.....	46	47	150	160
E. on C.R.....	14	10	40	50
N. on 23.....	48	44	90	200
Lone Pine S. Cy. Lts. C.R. to Keeler.....				
E. on C.R.....	144	171	250	190
N. on 23.....	27	32	100	100
N. on 23.....	121	143	350	290

District X				Station location				January, 1930				January, 1931			
Station location				Sun. Mon. 12 13				Sun. Mon. 12 13				Sun. Mon. 11 12			
Big Pine Jc. Rt. 63 to Oasis,															
S. on 23.				132				176				110			
E. on 63.				15				28				30			
N. on 23.				139				156				129			
Bishop 1/2 Mi. N. at Jc. C.R. N. to															
Laws & Dirt Road Easterly,															
S. on 23.				331				410				623			
N. on C.R.				163				263				330			
E. on C.R.												41			
W. on 23.				189				171				239			
Leevinig Jc. Rts. 10 and 23															
On 40.				Road closed, snow											
On 23.				24				35				90			
Mono-Iro Co. Line.				28				24				30			
Bridgeport at E. Cy. Lts.				Road closed, snow								110			
On Mono-23-K.															
Sonora Jc., Jc. Rts. 13 and 23,															
S. on 23.															
W. on 13.															
N. on 23.															
S. of Markerville Jc. Rt. 24,															
On 23.				Road closed, snow											
On 24.				Road closed, snow											
Jc. S.H. and C.R. at Woodfords,															
S.E. on 23.				5				9				60			
N.E. on C.R. to Minden.				4				9				70			
N.W. on 23.				2								40			
Picketts Jc., Jc. Rt. 34,															
W. on 34.				Road closed, snow											
E. on 34.				Road closed, snow											
N.E. on 34.				Road closed, snow											

Route 24. Route 4, Near Lodi, to Route 23, Near Silver Creek

District X				Station location				January, 1930				January, 1931			
Station location				Sun. Mon. 12 13				Sun. Mon. 12 13				Sun. Mon. 11 12			
Lodi Jc. Rt. 4.				1,007				1,042				1,400			
Jc. Rt. 24 and C.R. to Ione,															
W. on 24.				1,316				728				1,460			
N. on C.R.				279				282				600			
E. on 24.				1,057				511				850			
Bet. San Andreas and Valley Springs				1,045				216				910			
Jc. Rt. 24 and C.R. to Vallecita,															
N. on 24.				421				150				1,200			
S. on C.R.				65				60				180			
W. on 24.				453				174				1,200			
Jc. Rt. 24 and C.R. to Murphys,															
S. on 24.				405				118				1,600			
N. on C.R.				299				137				800			
E. on 24.				531				154				1,700			

Route 25. Nevada City to Downieville

District III				Station location				January, 1930				January, 1931			
Station location				Sun. Mon. 12 13				Sun. Mon. 12 13				Sun. Mon. 11 12			
Nevada City N. of Cy.				30				57				200			
Camptonville N. of Cy.				9				19				110			
Downieville Jc. Rts. 25 and 36,															
W. on 25.				17				12				110			
N. on 36.												10			
E. on 25.				17				13				120			

Route 26. San Bernardino to El Centro

District VIII				
S. Bd. S. of Cy. at N. end Santa Ana River Bridge, Jc. C.R. to Colton,				
N. on 26	2,020	2,230	3,828	2,866
W. on C.R.	1,792	1,913	3,541	2,023
S. on 26	4,398	3,690	6,692	4,507
Bet. S. Bd. & Redlands on 26 at Jc. of Hunt's Lane,				
E. on 26	4,510	3,677	6,300	4,600
W. on 26	4,607	3,795	6,300	4,600
At Interx. with Mt. View Ave. W. of Redlands,				
E. on 26	4,219	3,190	6,500	4,200
S. on C.R.	675	745	1,000	1,100
N. on C.R.	740	834	1,200	1,100
W. on 26	4,416	3,245	6,200	4,200
Colton Ave. at W. Cy. Lts. of Redlands	4,388	3,751	6,700	4,600
S.E. of Redlands Jc. C.R. to Yucaipa,				
N.W. on 26	3,471	2,068	4,700	2,700
E. on C.R.	436	493	620	590
S.E. on 26	3,148	2,119	4,100	2,100
At S. Bl.-Div. Co. Line	No count,	snow	4,600	2,600
Beaumont Jc. Jack Rabbit Trail,				
N.W. on 26	No count,	snow	3,700	1,900
W. of Jack Rabbit Trail,	No count,	snow	2,000	800
E. on 26	No count,	snow	3,300	2,600
Banning W. of Cy. Lts.	No count,	snow	5,400	2,600

Station location	January, 1930		January, 1931	
	Sun.	Mon.	Sun.	Mon.
N. of Cajon Jr. C.R. to Swartout Valley.	12	13	11	12
S. on 31	No count, snow		9,760	970
W. on C.R.	No count, snow		8,700	220
N. on 31	No count, snow		3,000	750
Victorville S. of Cy. Lts.	No count, snow		1,900	800
Helendale	No count, snow		880	490
S.W. Town Lts. of Harstow	No count, snow		990	550
Yermo E. of Cy. Lts.	No count, snow		*328	*392
Baker	No count, snow		310	230
Nevada State Line	No count, snow		170	70

*24-hour count.

Route 32. Route 2, Near Gilroy, to Route 4, Near Califa

District IV

Hollister Jr. Rt. 22,				
W. on 32	702	329	600	420
S. on 22	707	374	460	330
E. on 32	1,267	573	900	590
Pacheco Pass at Santa Clara-Merced Co. Line	1,155	459	940	360

District VI

Junction-Jc. C.R. to Gustine,				
W. on 32	1,067	466	750	433
N. on C.R.	241	133	220	190
E. on 32	922	391	670	400
Los Banos at Jc. S. P. Crossing (Near Maint. Yard)	1,761	2,232	1,900	2,200
E. of Los Banos at Jc. C.R. to Dos Palos,				
W. on 32	1,034	1,229	1,400	1,200
S. on C.R.	619	597	980	850
E. on 32	884	1,019	1,200	940
Merced-Madera Co. Line at Jc. C.R. to Merced,				
W. on 32	730	747	890	590
N. on C.R.	303	390	410	370
E. on 32	488	475	600	330
Califa Jc. Rt. 4	481	470	320	150

Route 33. Paso Robles to Route 4, Near Bakersfield

District V

Paso Robles E. of Cy. Lts.	849	1,117	1,400	1,100
Paso Robles 1/4 Mi. E. of Cy. Lts.	586	724	940	920

District VI

S. L. O. Kern Co. Line	367	340	258	200
Blackwell's Cor. Jc. C.R. N. to Coalings and S. to Taft,				
W. on 33	366	365	230	120
N. on C.R.	163	173	150	220
S. on C.R.	154	146	150	200
E. on 33	367	277	270	150
Lost Hills Inters. of Main St.,				
W. on 33	538	582	500	710
N. on Main	26	24	40	50
S. on Main	151	176	240	260
E. on 33	535	571	540	610
Wasco Jc. Co. Rd. S. to Wasco, near S. P. R. R. Xing,				
W. on 33	650	734	670	790
S. on C.R.	614	832	720	980
E. on 33	745	800	900	
Famosa Jc. Rt. 4	580	575	670	500

Route 34. Route 4, Near Arno, to Route 23, at Picketts Junction

District X

Twin Cities Jc. Rt. 4	355	367	550	470
W. of Jone Jc. C.R. to Michigan Bar,				
W. on 34	117	71	190	90
N. on C.R.	46	60	100	120
E. on 34	142	128	270	200
W. of Jackson Jc. Rt. 65 to Placerville,				
E. on 34	784	845	1,700	1,200
N. on 65	602	774	1,500	1,000
S. on 34	338	227	630	380
Jc. S. H. and C.R.				
S.W. on 34	71	33		
N.W. on C.R.	33	29		
E. on 34	91	82		
Pine Grove E. of Town,				
W. on 34		280	120	
N. on C.R.		170	160	
E. on 34		400	290	
Picketts Jr. Rt. 23 and 34	No count	No count		

Route 35. Peanut to Kuntz

District I

At Peanut	2	2	7	6
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Route 37. Auburn to Nevada Line Near Verdi

District III

Station location	January, 1930		January, 1931	
	Sun.	Mon.	Sun.	Mon.
Auburn E. of Cy.	2,275	723	2,270	790
Colfax E. of Cy. Grass Valley Road,				
W. on 37	448	171	1,560	290
N. on C.R.	190	121	150	190
E. on 37	386	153	1,450	120
Emigrant Gap Jc. Rts. 15 and 37,				
W. on 37	Road closed	Road closed	Road closed	Road closed
W. on 15	Road closed	Road closed	Road closed	Road closed
E. on 37	Road closed	Road closed	Road closed	Road closed
Donner Lake Camp W. of Truckee,				
W. of Jc. with Rt. 38, S. to Lake Tahoe				
W. on 37			Road closed, snow	
S. on 38			Road closed, snow	
E. on 37			Road closed, snow	
Truckee at McJivers W. of Cy.			270	50
Truckee E. of Cy. at Jc. with Rd. 38 to Nevada Line,				
W. on 37	134	19	470	140
E. on 38	135	21	450	130
N. on C.R.	2	1	40	10

Route 38. Myers to Nevada Line Via Truckee River

District III

Tahoe City Jc. Rt. 39,				
S. on 38			Road closed, snow	
E. on 39			Road closed, snow	
N. on 38			Road closed, snow	
Truckee, W. of Cy. at Jc. Rt. 37			Road closed, snow	
Truckee E. of Cy. Jc. Rt. 37	135	21	450	130
California-Nevada State Line	276	38	800	110

Route 39. Tahoe City to Nevada State Line

District III

Tahoe City Jc. Rt. 38				
Near Brockway Jc. C.R. to Truckee			Road closed, snow	
			Road closed, snow	

Route 40. Route 13, Near Montezuma, to Route 23, Near Mono Lake

District X

Mt. Pass Jr. Rt. 13,	137	60	100	70
1 Mi. E. of Groveland on 40	37	17	70	100
Aspen Valley Checking Station on 40	No count	No count	No count	No count
Gentry Checking Station on 40	No count	No count	No count	No count
Mono 40-A. Jc. with Mono-23-H	No count	No count	No count	No count

Route 41. General Grant Park to Kings River Canyon

District VI

W. of Hume	No count	No count	No count	No count
E. of Hume	No count	No count	No count	No count

Route 42. Saratoga Gap to State Redwood Park

District IV

Waterman Switch,				
E. to Saratoga Gap on 42A	34	18	140	60
W. to Redwood Park on 42A	40	18	40	30
S. on C.R. to Boulder Creek	160	38	140	100
Saratoga Gap at Redwood Park Gate		1		

Route 43. San Bernardino to Big Bear Lake

District VIII

Post Waterman Grade	No count, snow	5,600	440	
Waterman Canyon Jc. of New Forest Highway with Old Rd. on Switchbacks above Old Panorama Point,				
Old Rd. above Jc.		670	90	
New Rd. above Jc.		5,000	230	
New Rd. below Jc.		5,300	330	
Squirrel Inn Jc. of New Forest Hwy. with Old Crest Drive,				
W. Old Rd.		920	70	
N.E. on 43		4,200	70	
S. on 43		710	30	
S. on 43		1,100	150	
Traffic up New Forest Hwy. turning toward Crestline		210	10	
Traffic from Crestline turning down New Forest Hwy. at Squirrel Inn Jc.		300	10	
Pinecrest Jc. C.R. to Lake Arrowhead,				
S.W. on 43	No count, snow	1,300	100	
N.E. on C.R.	No count, snow	1,200	120	
N.W. on C.R.	No count, snow	220	30	
E. on 43	No count, snow	No count, snow	No count, snow	

[illegible]

Station location	January, 1930		January, 1931	
	Sun. 12	Mon. 13	Sun. 11	Mon. 12
Je. Rt. 57 and 4	72	69	480	210
Bakersfield E. Nile and School				
House Easterly Cy. Lts.	2,168	2,294	2,600	2,400
Bakersfield To Mt. E. at Jr. Co.				
Club Rd. and Ker-57 E. on 57	603	239	570	360
Redfish at Interx. Rt. 57 with C.R.				
to Caliente.				
E. on 57	25	37	140	210
S. on 57	23	38	120	190
S. on C.R.	7	5	39	60

Route 58. Mojave to Arizona Line Near Topoc via Barstow

District IX			
Mojave	47	92	170 170

District VIII

Kramer-Kern Co. Line.	No count, snow	210	150
Yermo N. of Cy. at Je. 31 to			
Yermo.			
S. on 58	No count, snow	810	880
N. on 58	No count, snow	460	500
N.E. on 31	No count, snow	440	400
Daggett Jr. Arrowhead Trail Old			
Trails Hay.			
N. on C.R.	No count, snow	230	160
W. on 58	No count, snow	480	320
E. on 58	No count, snow	310	260
Vicinity Newberry Springs	No count, snow	* 242	* 253
Vicinity Aubrey	No count, snow	270	190
Near Bannock Jr. C.R. to Search-			
light.			
W. on 58	No count, snow	160	160
N. on C.R.	No count, snow	50	40
E. on 58	No count, snow	210	190
Needles W. of Cy Lts.	No count, snow	690	400
Needles 5.7 Mi. S. Je. to Parker			
and Blythe.			
S. on 58	No count, snow	230	160
S.W. on C.R.	No count, snow	30	30
N. on 58	No count, snow	300	220

Route 59. Lancaster to Baileys

District VII			
Lancaster Jr. Rt. 23	450	529	1,200 1,000
Bailey Ranch	1	No count	370 90

Route 60. El Rio to San Juan Capistrano

District VII			
El Rio Jr. Rt. 2 and 60	2,860	3,616	6,200 3,800
Oxnard South of City Lts on			
Ven-60-A	1,784	2,017	6,000 3,100
Topanga Canyon on 60	4,098	3,767	14,200 4,400
on 60	572	725	1,900 610
Santa Monica Interx. Beverly and			
L. A. 60-B Santa Ynez Canyon.			
W. on 60	1,986	1,968	14,100 4,100
On Beverly Blvd.	No count	5,200	1,000
E. on 60	2,030	1,760	16,500 5,100
On Santa Monica Canyon Rd.	6,778	6,254	10,600 3,900
Lomita on Redondo-Wilmington Rd.			
on 60	5,123	6,876	0,800 7,700
Seal Beach at L. A.-Orange Co.			
Line	5,603	5,344	11,300 6,200
Newport W. of Cy.	3,344	2,831	7,100 2,600
Newport at Interx. Newport-Tustin			
Road.			
W. on 60	2,653	2,298	5,600 2,000
N. on C.R.	2,933	2,912	4,100 3,500
S. on C.R.	1,781	2,240	4,300 3,100
E. on 60	3,376	2,882	6,800 3,100
Serra Jr. Rt. 2 and 60	1,895	1,873	4,400 2,700

Route 61. La Canada to Mt. Wilson Road via Arroyo Seco

District VII			
Pasadena at N. Cy. Lts.	3,661	605	3,200 760

Route 63. Big Pine to Oasis

District IX			
Big Pine, Jr. Rt. 23	15	38	30 50

Route 64. Mecca to Blythe

District VIII			
Desert Center	94	91	* 153 * 142
Blythe, S. D. A. Quarantine Sta.	101	66	40 35

* Twenty-four hour count.

Route 65. Auburn to Sonora

District III					
Station location		January, 1930		January, 1931	
		Sun. 12	Mon. 13	Sun. 11	Mon. 12
Auburn at Wire Bridge, American River.					
N. on 65		40	53	402	290
E. on C.R.		7	9	175	100
S. on 65		34	39	234	190
Placerville N. of Cy. Je. George-town Rd.					
N. on 65		129	167	511	519
N. on C.R.		13	28	150	190
S. on 65		142	196	516	560
El Dorado Jr. Rt. 11		50	41	130	260

District X

Central House Jr. Rt. 54 to Michi-				
gan Bar.				
N. on 65	232	196	560	540
W. on 54	289	201	660	480
N. on 65	275	244	710	510
N. of Jackson Jr. Rt. 34.				
N. on 65	692	774	1,500	1,000
E. on 34	784	845	1,700	1,200
S. on 34	338	227	630	380
S. of San Andreas at Sheep Camp	1,001	381	1,200	590
W. of Sonora Jr. Co. Rd. to				
Jamestown.				
N.W. on 65	102	70	260	360
S.W. on C.R.	52	36	150	90
S.W. on 65	108	26	220	330

Route 66. Manteca to Route 5 Near Mossdale School

District X			
Mossdale Jr. Rt. 5	1,855	1,387	2,687 1,521

Route 67. Pajaro River to Route 2 Near San Benito River Bridge

District V			
San Juan Bautista N. of City at			
Jr. Rt. 2	1,494	1,051	1,200 850

Route 68. San Francisco to San Jose

District IV			
N. Cy. Lts. S. San Francisco	8,933	7,949	14,000 11,700
S. San Francisco at Underpass	7,557	5,617	14,000 11,500
Burlingame Jr. Rt. 68 and Broadway.			
N. on 68	7,009	5,658	12,000 9,000
W. on Broadway	2,401	2,734	2,600 4,000
S. on 68	5,383	3,669	10,000 5,800

Route 69. San Quentin Road

District IV			
San Quentin Hill	2,049	1,135	
Richmond to San Rafael Ferry			1,267 585

Route 70. District IV

Utah Jr. Rt. 1	529	651	670 680
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Route 71. Crescent City to Oregon Line

District I			
Crescent City N. of Town at Maint.			
Yard	616	563	710 770
Oregon Line	198	183	670 376

"How old are you?" inquired the visitor of his host's little son.

"That is a difficult question," answered the young Boston lad, removing his spectacles and wiping them reflectively. "The latest personal survey available shows my psychological age to be twelve, my moral age four, my anatomical age seven, and my physiological age six. I suppose, however, that you refer to my chronological age, which is eight. This is so old-fashioned that I seldom think of it any more."—*Milwaukee Engineering*.

Man (to small boy eating apple): "Look out for worms, little boy."

Boy: "When I eat an apple the worms must look out for themselves."

STATE OF CALIFORNIA

Department of Public Works

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DIVISION OF CONTRACTS AND RIGHTS OF WAY

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DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



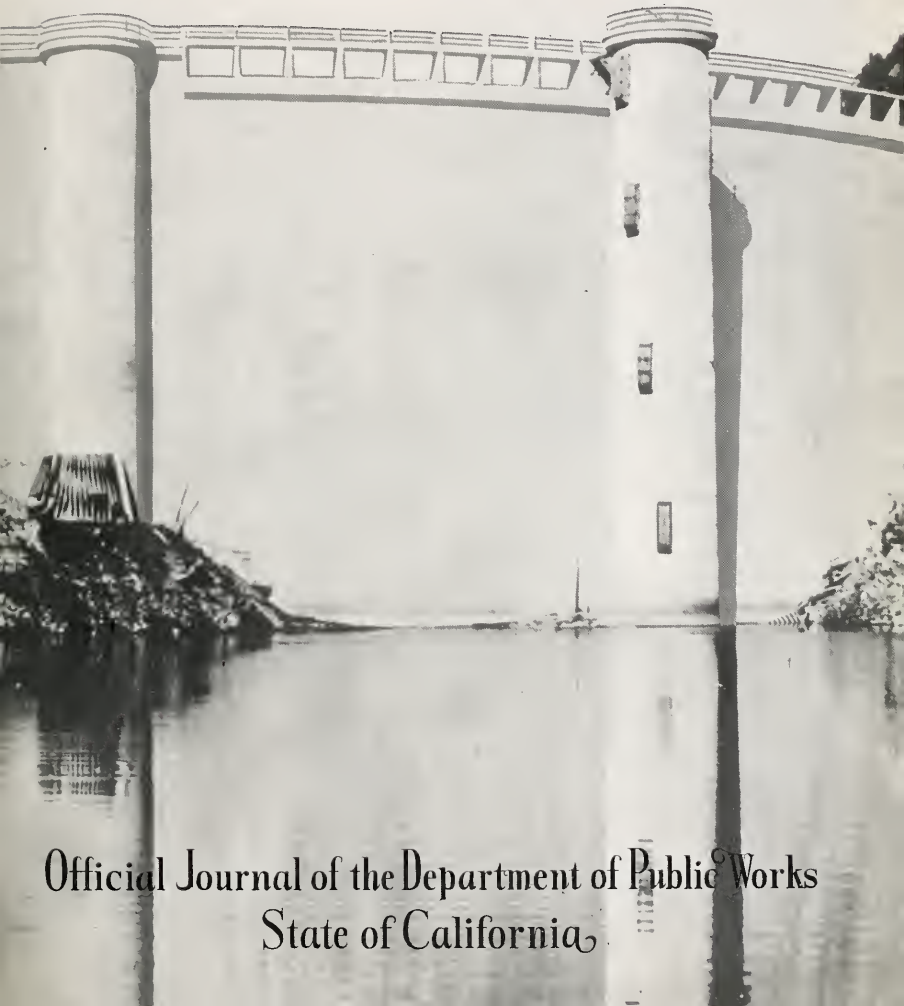
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Public Works and Prosperity

By TIMOTHY A. REARDON, Member California Highway Commission

IT IS an ill wind that does not blow someone some good.

Out of the now departing business depression, there has come for the first time something of public realization of the part that public works can play in staying depression and in promoting prosperity.

Hitherto public works and prosperity has been largely a matter of theoretical discussion among political economists. The economists have preached, but the public has not practiced.

Today the public generally knows the expansion of public works during a time of unemployment and business depression, is a palliative and a remedy, both relieving distress and hastening a cure.

In California the extension of state highway work has proved of inestimable value to holding up business and providing an increased market for labor. One reason for this is the wide distribution of state highway activity. State highway dollars travel into every county of California. They find their way into homes in both metropolitan centers and rural communities.

Added to this is the further helping fact that the State is a cash customer. It does not ask credit.

State highway work is of further value in that it bends itself to a wide distribution among labor. There is much State highway work that requires the service of the skilled mechanic. Much must also be done by the handworker.

The work also requires large purchase of supplies both locally and in manufacturing and business centers.

In past depressions public works have not played the part in supporting business and employment that they could have taken because of the long time that of necessity elapses between the authorization of a project and actual construction. This time is not wasted, but is taken up in preliminary and final engineering, and the development of finances to pay costs.

We have learned in this depression the value of having on hand a reservoir of public improvement projects, upon which the basic engineering has been done and which are quickly available for construction activity in dull and depressed times.



TIMOTHY A. REARDON

If State Highway Engineer C. H. Purcell had not such a reservoir of projects available, it would have been impossible for the California Highway Commission and Colonel Walter E. Garrison, Director of the Department of Public Works to have speeded up the highway program to the extent that it has been advanced at the request and under the instructions of Governor Rolph.

Neither the State, the counties or the cities of California should allow their cupboards to be entirely empty of such projects.

This is the outstanding lesson that eighteen years service as president of the Board of Public Works of San Francisco has taught me. The lesson has been confirmed by my experience as a member of the California Highway Commission.

The difficulty with such a program lies in the insistence of the people concerned for immediate construction of any project that they learn is in contemplation. This can be overcome, however, by proper publicity to the

(Continued on page 7.)

Governor Rolph Opens New Unit of Bayshore Highway

By COLONEL JNO. H. SKEGGS, District Engineer

A MOST IMPORTANT LINK, in so far as the traveling public is concerned, of the Bayshore Highway, between San Mateo and Redwood City, was formally dedicated to the public by Governor Rolph, who made a special trip from Sacramento for the occasion, on the 14th day of May, 1931.

Present with the Governor were Colonel Walter E. Garrison, State Director of Public Works, and C. H. Purcell, State Highway Engineer, from Sacramento; State Highway Commissioner Timothy A. Reardon of San Francisco and Colonel Jno. H. Skeggs, District Engineer, under whose supervision the work had been completed.

Prior to the formal dedication, a group of public spirited organizations and citizens of Redwood City gave a luncheon at Emerald Lake for their honored guests; after which the assemblage proceeded to the south end of the new highway at Redwood City, where a parade of the school children of this city took place—reflecting the interest not only of present citizenship, but of the future leaders of this wide-awake community in this highway achievement. The ceremonial, in which the Governor cut the ribbon for formal opening of this 7.4-mile section of the Bayshore Highway, was started at 2 p.m.

Previous to the construction and opening of this section between San Mateo and Redwood City, the Bayshore Highway served as a fast interurban artery to a terminus at Fifth avenue in San Mateo, at which point all travel to the south was forced to proceed to the Peninsula Highway, causing great congestion and the inconvenience to motorists of cross traffic through the towns of San Mateo, Redwood City, Menlo Park and Palo Alto.

RELIEVES CONGESTION

The opening of the new link, however, by connecting at Redwood City with Washington Street and the Middlefield Road, an excellently paved county highway, gives the motorist assurance that he can travel from the heart of San Francisco to Palo Alto, or East Bay points via the Dumbarton Bridge, without being forced into the overburdened Peninsula Highway at any point. Thus, all the heavily settled urban territory in the twelve-

mile strip of the peninsula between San Mateo and Palo Alto is given the advantage of two arterial highways into San Francisco.

CONSTRUCTION DIFFICULTIES

The difficulties of constructing this important strip of highway were many, due to the fact that it traverses for almost its entire length the marshes and the many salt ponds of this territory, where gradual settlement of the roadbed can normally be expected for some years to come. That section of the Bayshore Highway between South San Francisco and Burlingame, which traverses a terrain similar to that of the new section, was first graded in 1924; but, due to gradual settlement, was not considered ready for heavy type concrete pavement until 1930. The first four miles of the new section—namely, between San Mateo and Belmont—were constructed entirely of fill material obtained from the rocky knoll located at Belmont, just west of the Bayshore Highway and south of Harbor Boulevard. The last three miles were constructed by pumping in material from the bay adjacent to the highway between previously constructed levees, a blanket fill, however, of two feet in thickness of the material from Belmont Hill being placed over the hydraulic fill.

The cost of this section of highway was \$450,000 for grading and \$135,000 for rock base and temporary surfacing, bringing the total expenditures to date upon the twenty miles of the Bayshore Highway now open to traffic, from the county line at San Fran-

(Continued on page 40.)

PICTURES ON OPPOSITE PAGE

Top Picture—Governor Rolph is greeted by delegation of peninsula women; center—Governor Rolph cutting the ribbon, formally opening the Bayshore Highway from San Mateo to Redwood City; lower—Colonel John H. Skeggs, District Engineer headquarters, San Francisco; C. H. Purcell, State Highway Engineer; Mayor Stafford of Redwood City; Governor James Rolph Jr.; Colonel Walter E. Garrison, Director of the Department of Public Works; and Timothy A. Reardon, member of the California Highway Commission.



California's Highway Leadership

By DR. L. I. HEWES, Deputy Chief Engineer, U. S. Bureau of Public Roads, San Francisco Headquarters*

AT A DINNER some years ago in the Palace Hotel, in honor of Dr. Swazey, who makes the chasses for the world's great telescopes, the guest of honor said the engineer bridged the gap between science and industry. That is particularly true in respect to the modern highway engineer. The roads of our country prior to 1893 had received little or no engineering. The present epoch is the epoch of highway transportation and the engineer has found his job in the application of an increasingly complex body of scientific facts to highway betterment.

This application of science to highways has been particularly successful in California. This State has always been an inspiration to the entire country in her leadership. California was first in a number of very important highway developments. It was the California State Highway Department that first established concrete as a standard State pavement. It was California that passed the first real contractor's prequalification law, recently followed by Oregon and Nevada. It was in California that the first bridges were constructed with inverted vertical grades. It was California that introduced the new asphaltic oil road mix and built such structures as the Rincon Seawall, and it is California that now dares to set up continually higher standards of design.

There are times when we have a conviction of the complete achievement. Roads such as the new three-way pavement on beautiful lines through Rose Canyon near San Diego are examples of what I mean. We almost know this highway will be adequate for all time.

I say "almost" advisedly. The march of time is an inexorable force. No man can hope for the complete survival of his ideas in time. Time is invincible. Law and science strive in vain for permanency in time. You may see much of what I mean in the films that are now being shown in San Francisco of the city of 1906—Market Street at the time of the fire. It is a remarkable scene, a living record of a quarter of a century past. You have a high sense of the progress of the years. There are the poor dirty cobble pavements, the little cable cars with a toy turntable at the Ferry

Building, the absurd two-story slow automobiles high above the street, the long skirts of women sweeping the pavement, a confused movement of slow traffic. You gaze with amazement, you recognize in a flash that inexorable law of the forward movement that time must bring.

And so we can not be too sure of our present standards. The engineers who gear science into industry must be alert and willing to progress. Law must not lag too far behind in formulating scientific discovery.

New ideas come constantly. A few days ago I had the pleasure of a call from Mrs. W. L. Lawton, who is making a study of California roadsides—a survey sponsored by the American Nature Association. We are thinking new thoughts about our roadsides. I told Mrs. Lawton of some things the California State Division of Highways was doing for roadside improvement. There is to me no more inspiring effort for roadside beauty than that struggle that is being waged to establish an avenue of trees along the highway south of Bakersfield—a struggle of years against heavy odds and now successful. Too often the landscape people try to force beautiful effects exclusively through the engineering. I think Mr. Purcell is giving a noteworthy example of how to restore roadside beauty in his work on the Skyline Boulevard. Here a log grillage against the stony slopes offers place for earth seed beds behind the horizontal logs and soon those obstinate raw cut slopes will be covered with pleasing vegetation. We may, twenty-five years hence, look back to pictures of ugly sign-littered highways with surprise and amusement. We can only strive now to move in the right direction.

The engineer dealing with facts of nature can not develop his imagination in all directions. He must follow closely scientific discovery and school himself to foresee its application. He is now in the midst of a vast new movement—this era of enormous highway traffic. His vision is primarily concerned with the realities of that action. In California, for example, highway grading is often extremely expensive. Roadbed costs here are greater than in the prairie states like Illinois and Iowa that are setting up records for yearly pavement mileage. Such mountains as ours tax the genius of the engineer in his design and in his allocation of funds.

* This article contains the substances of an address given by Dr. Hewes at a dinner given in his honor at Sacramento on April 22, 1931, at which Assemblyman George Biggar, chairman of the Assembly Roads and Highways Committee, was the host.

Federal funds have helped California in considerable measure. For National Forest highways about 9,000,000; for the Federal Highway System about 38,000,000; and several million for the four national parks. We are finding it pleasant to work with the California Division of Highways. One of the happy items in the Bureau of Public Roads is its colonization. We have supplied states with engineers. When we gave you Purcell we felt that business in still another state was on an assured sound foundation.

We engineers are not much worried in this State nor in others about details of engineering nor with the immediate construction problems. If, however, we keep our vision broad, we must realize that time is also preparing for us its inexorable test. We must realize that there is always an irresistible forward surge of economic adjustment. We must admit that an element of change similar to that which has transformed the Market Street of 1906, will operate upon our own work of 1931. We can not be too vigilant in our effort to know in what direction that change will move us. It is our duty to furnish the record of the present highway era to you of the law-making body who must deal in a broader way with the great problems of economics and the future operation of our modern highways.

Appointments Made To Highway Patrol

TEMPORARY appointment of fifteen traffic officers to serve as members of the California Highway Patrol was announced today by Superintendent E. Raymond Cato.

The men have been assigned to duty in Sacramento, Yolo, Lake, Modoc, Mariposa, Mono and Inyo counties, it was announced, and will be used to augment existing squads and to assist in working out plans for a permanent night patrol. The men were all appointed from the lists submitted by the Boards of Supervisors in the respective counties.

Superintendent Cato also announced the appointment of Clarence Warden, former foreman of the State highway maintenance shops at Sacramento, to act as traveling equipment inspector for the patrol. Warden will travel from county to county checking up equipment of the men. He will also assist in the establishing of district servicing stations. The names of traffic officers appointed follow:

Merit Citations Are Awarded to 11 Traffic Officers

Eleven members of the California Highway Patrol were cited during the month of April for services of an unusually commendable nature, Superintendent E. Raymond Cato announced today.

Seven of the men received letters of commendation because they were instrumental in capturing thirteen automobile thieves during the month. These were L. R. Frye, O. H. Ellis and W. H. Rutherford of Santa Barbara County; C. A. Loomis of San Luis Obispo County; E. L. Stuart of San Joaquin County; A. Rawles of Mendocino County, and Leo Ramsey of Monterey County.

Officer Ramsey was commended particularly because, after being called at 2 o'clock in the morning from his bed, he arose and checked hotels, hospitals and other places until two men who had stolen a car were found.

L. E. Euer, border checker in Humboldt County, was cited because he was instrumental in the arrest of a man and woman wanted for passing worthless checks.

J. L. Degnan, a border checker in the same county, was cited for apprehending two run-away boys from Portland, Oregon.

R. A. Paquette and B. H. Combs, traffic officers of Kern County, were commended for the arrest of a man engaged in the smuggling of Chinese across the border. The man arrested and the Chinese were turned over to the Federal authorities.

FRONT COVER PICTURE

Picture on the front cover of this issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS is a view of the Junical Dam in Santa Barbara County.

And it came to pass that a green business man read in black and white that business is in the red. And lo, when he beheld these tidings, he became blue, for he was already yellow.—Indigoitis.

Sacramento County—E. L. Bond, H. C. Cruse, F. A. Gabrielli, L. J. Jarvis and Francis J. Perry.

Yolo County—J. E. Dickey, E. J. Englehart, Chas. A. Leathers, J. F. Granucci.

Lake County—C. R. Burris.

Modoc County—F. W. Caldwell.

Mono County—N. G. Nicoll.

Mariposa County—J. H. Ellingham, G. M. Berthen.

Inyo County—L. J. Roeper.

Building Bridges By Revenue Bonds

By CHARLES C. CARLETON, Chief, Division of Contracts and Rights of Way, State Department of Public Works *

THE recent decision of the Supreme Court of California upholding the constitutionality of the California Toll Bridge Authority Act of 1929 (*California Toll Bridge Authority et al. vs. Wentworth, etc.*, 81 Cal. Dec. 615), completes a coast-to-coast hookup of favorable court ruling sustaining the validity of the financial plan of meeting the cost of construction of large public projects, such as bridges and tunnels, through the medium of their own earnings derived from tolls paid by the actual users of such conveniences rather than by the old-fashioned method of issuing bonds secured by taxes on general property. This decision, we believe, is the first expression of a western court in a State case holding that revenue bonds retired entirely from tolls do not violate the limitations usually prescribed by state constitutions that debts or liabilities of the states exceeding a fixed amount (in California, \$300,000) shall not be created without a vote of the people; and that, as a matter of law, they do not constitute the "debts" or "liabilities" at all, for the very explicit reason that the credit of the states is not pledged in such bonds.

SOLUTION OF TOLL BRIDGE PROBLEM

Two years ago State officials of California were approached to aid in the solution of the toll bridge problem rapidly developing in this State.

Several private companies had, with an investment of about \$20,000,000, erected large toll structures in key positions in the highway system of the State, and for many years it had been the dream of San Francisco, Oakland and other municipalities bordering San Francisco Bay to span that great expanse of water with a colossal bridge.

Local officials had been swamped with applications of private promoters to construct a privately-owned bridge or tube connecting the city of San Francisco with the county of Alameda on the opposite shore.

NEW POLICY ADOPTED

While credit is due the initiative and enterprise of private capital in overcoming many obstacles and actually completing several fine toll bridges, now serving traffic, yet it seemed as if by spontaneous agreement immediately



C. C. CARLETON

prior to the 1929 session of the California Legislature, State, county and city officials and civic leaders concluded that the day of privately promoted toll bridge was ended in this State; and in the future in extraordinary cases where the cost of new structures would be so vast that it would deplete current highway funds the structures should be financed as publicly owned projects through the use of revenue bonds with the object in view of them becoming free bridges at the earliest possible time.

The Legislature of 1929 quickly grasped the proposition and by practically unanimous action passed the enabling legislation which has now been upheld by the Supreme Court of the United States.

Moreover the Legislature adopted the following ringing declaration of State policy, "It is hereby declared to be the policy of the State of California to acquire and own all toll bridges situated upon or along any part of the highways of the State, with the end in

* Reprinted from the United States Daily.

view of ultimately eliminating all toll charges thereon."

Nothing has occurred the past two years that has altered or diminished the determination of California to acquire and own the future, necessary toll bridges in its system of highways and to make them pay for and free themselves as soon as practicable.

The timely decision of our Supreme Court has given a great impetus to this movement.

SAN FRANCISCO BAY BRIDGE

The first project to be undertaken under the provisions of the California Toll Bridge Authority Act and through the California Toll Bridge Authority and the State Department of Public Works is a huge bridge about four miles and one-half in length, extending from the city of San Francisco to Goat (also known as Yerba Buena) Island in San Francisco Bay; thence to the city of Oakland, the cost of which is estimated at \$75,000,000.

The location of the bridge has been determined after a thorough survey of navigation needs, vehicular traffic movements, and terminal locations, and extensive borings made to ascertain foundation conditions, under the direction of a special commission appointed by the President of the United States and the Governor of the State of California, known as the Hoover-Young Bay Bridge Commission.

Before its recent adjournment the Congress of the United States passed an act granting a permit for the construction of the bridge. The Legislature of California now in session is passing an appropriation of \$650,000 for necessary plans and estimates which appropriation will be returned to the State Treasury out of the first sale of revenue bonds.

Governor James Rolph, Jr., of California has given orders that the California Toll Bridge Authority and the State Department of Public Works "go right ahead with the work, with no delay."

The dream of the residents of the region about the Golden Gate is about to become a reality.

THE COURT'S DECISION

The Supreme Court of California in its decision comments on the fact that the revenue bond plan of financing toll bridges has been held to be constitutional by the highest courts of the following states, citing certain leading cases in their respective jurisdictions.

West Virginia: *Bates vs. State Bridge Commission et al.*, etc. 153 S. E. 305.

Alabama: *Alabama State Bridge Corporation vs. Smith*, 116 So. 695.

Kentucky: *Estes vs. State Highway Commission*, 29 S. W. (2d) 583.

Arkansas: *Bush vs. Martineau*, 295 S. W. 9.

These states are already well embarked on large publicly-owned toll bridge enterprises.

No article on this subject would be complete without acknowledgement to The Port of New York Authority for its splendid accomplishments under the revenue bond plan of financing. The able management of that public corporation, created jointly by the States of New York and New Jersey, to carry out the terms of The Port Treaty adopted by the two states, has developed this method to the highest degree of safety and saleability.

Without ultimate cost to the general taxpayers of those states great bridges, such as the spectacular George Washington Bridge across the Hudson River, thus financed, are springing into existence, and a new tunnel under the Hudson River and an immense freight terminal building will in the not distant future become available to public use.

Vast undertakings, which, if dependent upon the issuance of property tax-secured bonds would be long deferred or, perhaps, never erected, are through their own earnings literally pulling themselves up into place by their own financial boot straps.

With such notable examples of signal success elsewhere California enters upon its own ambitious bridge programs with sanguine spirit.

The Text of the Decision of the Supreme Court of the San Francisco Bay Bridge Case will be found on page 19.

PUBLIC WORKS AND PROSPERITY

(Continued from page 1.)

purposes which the particular project is intended to serve, and by educating the people to the value of protection against depression through having always on hand a supply of immediately available improvement projects which have been thoughtfully considered in advance and upon which the basic engineering has been carefully completed.

Such a program eliminates the danger of undertaking projects, conceived in moments of hysteria, and undertaken without proper economic and engineering facts.

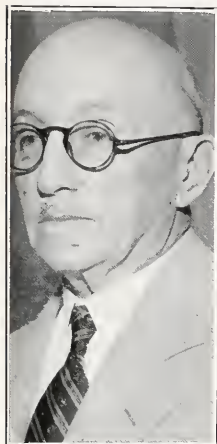
Such a public works policy is the best and cheapest insurance against adversity that states, counties or cities can purchase.

California Prepares for Tourist Crop

By FRANK G. SNOOK, Chief of the Division of Motor Vehicles

CALIFORNIA is ready to receive what we confidently believe will be the biggest crop of out-of-state tourists in her history.

More than ever we believe that California will continue to be the nation's motoring ground this season for already vacationists from every state have begun to pour over our borders.



FRANK G. SNOOK

Many of these will remain in California to make their permanent homes here. The majority, however, are coming simply for a good time, to enjoy the balmy weather and ideal motoring conditions that no place affords like the Pacific Coast.

Anticipating this annual influx of tourists we have put our border "courtesy" checking stations in order. These stations afford us the opportunity for giving an official

welcome to the visitors as well as to explain to them our motoring regulations and the details of our registration laws.

In southern California we have border stations at Yuma, at Daggett and at Yermo, these stations covering the principal routes into the State.

In the far north we have stations at Clam Beach and at Dunsmuir covering the Redwood Highway and Pacific Highway respectively.

By the time this is in print we will have opened our stations at Donner Lake and Myers, covering the two principal routes over the high Sierra.

At each of these stations a competent staff of checkers is maintained under the direction of an experienced traffic officer. These men have orders to treat motorists entering the State with the utmost courtesy.

Records of all cars entering the State with

license plates other than those issued by California are kept. If the motorist intends to remain in the State less than ten days he is advised to proceed.

If he expects to remain longer, he is advised to take out a visitor's permit which gives him the right to remain in the State six months without securing a California license. No other state in the Union has such extremely liberal provisions.

Our men at these stations are able to give the tourists much valuable information concerning the points of scenic interest in the State and the best roads. Our whole endeavor is to have the tourist leave the station with a feeling that he is in a friendly land where he will be well received.

Our men at the stations carry on a constant campaign of propaganda for safety and safe driving. Tourists are told of the necessity of careful driving and of keeping within the speed limit.

The automobile tourist crop is worth many thousands of dollars to California and greater numbers should be encouraged to come here for no place in the world can offer such ideal motoring conditions so many days in the year.

Much has been said about California's motor vehicle death rate and the large number of people killed and injured here every year.

While there are entirely too many accidents of a fatal nature in California and most of them could be prevented by more careful driving, comparisons made with other states will be most unfair unless the death rate be computed against gasoline consumption.

Because our climate permits all-year driving of motor vehicles, the accident hazard per car is necessarily higher than in states where driving is impossible from three to six months in the year. In other words the vehicle that travels most in a year will necessarily be exposed to the greater accident hazard.

Figured on gasoline consumption 19 states have a higher motor vehicle death rate than California. Our rate of 1.81 deaths per million gallons of gasoline consumed is well below the general average of 1.99 for 34 states.

Tourists, therefore, who come to our State are actually safer driving on our highways than in other states as the figures will show.

And factors of safety become greater every year as our splendid road-building program is developed and as more men are added to the California Highway Patrol to protect the motorists.

The importance of our tourist crop is best evidenced by the fact that we issued visitors permits for 91,247 cars last year. We estimate these cars contained at least three persons each which would give a grand total of some 275,000 persons entering the State by motor. Many thousands more of whom we have no records were visitors.

We believe the average sum spent by these tourists in our State was at least \$50 each.

In this connection it may be well to remind our own people that the "playtime" season is approaching when traffic is heaviest on roads leading to mountain and seaside resorts and to remind them of the necessity of careful preparations for the vacation motor trip and of careful driving while on the roads.

No motorist should endanger the lives of himself, his family and others by starting out with a car equipped with faulty brakes, glaring headlights or defective vulnerable parts.

Observe the law with respect to loading baggage and camping equipment. Nothing should extend farther than the hub caps on the left of the vehicle or more than six inches beyond the hub caps on the right. License plates must not be covered and spare tires may not be carried on the front of the vehicle.

Respect the law while on the highways. California now has a highway patrol second to none under the able leadership of Captain E. Raymond Cato. Cato's men are on the roads to help and protect you on your vacation trip.

When driving on steep roads in the mountains use your low and second gears. They were put on the car for that purpose. Keep well to the right at all times but particularly on the curves.

APPOINTMENT IS ANNOUNCED

Eric Cullinward, former newspaper man of Los Angeles and San Francisco, has been appointed secretary of the California Highway Commission and editor of CALIFORNIA HIGHWAYS AND PUBLIC WORKS, succeeding George C. Mansfield. Mr. Cullinward will assume his duties on June 1st.

A survey of the origin and destination of heavy traffic was made recently in San Francisco for the purpose of working out new routings for trucks plying between the city's water front and its 75 commercial and industrial areas.

Sale of "Right to View" Proposed as Billboard Solution

A PLAN for protecting rural roadside scenery against too many arguments to purchase this, that and the other thing, by putting the question up to roadside property owners instead of the police, was adopted in Washington by the second meeting of a special Conference on Roadside Business and Rural Beauty.

The plan, formally accepted by representatives of the billboard interests, and automobile and farm groups, provides that rural views can be preserved if three-fourths of the owners of certain strips of land want to keep the area cleared of billboards and other commercial uses. And in return for giving up revenues from rentals of roadside space, this plan would have state and local authorities recompense the landowners by "greatly enhancing" their properties through gifts of copious plantings of trees and shrubbery, for the purpose of creating a scenic highway system.

The plan was presented in the form of a model bill drawn and put before the meeting by Herbert U. Nelson, Executive Secretary of the National Association of Real Estate Boards that, with other national organizations, has been working for years on the question of possible control of commercial uses that destroy roadside beauty.

Called a just and sound solution of the billboard problem, by Senator George Wharton Pepper (Pennsylvania) chairman of the conference, the Nelson plan is the only plan advanced thus far that does not attack the question from the heretofore unsuccessful point of view of using the police power of the State to clear scenic spots of the "appealing" signs.

This plan, giving leeway to the billboard interests and accepted by their representatives at the conference, cites "necessary" exceptions where boards and signs may be used in scenic areas, but makes it possible for three-fourths of the owners of roadside land to petition the proper authorities to bar commercial uses. With such a petition, the majority owners of not less than a half mile or more than ten miles of roadside land would convey their "rights to the view" to the township, county or state, and the rights of the remaining one-fourth of the owners then would be taken by condemnation proceedings.

(Continued on page 11.)

Relief Results from Relief Employment

By L. H. GIBSON, District Engineer

THE results obtained from the establishment of unemployment camps, and the enlargement of maintenance crews to take care of more of the unemployed, has demonstrated the great good that has been performed by the Department of Public Works through its policy in assisting in the nation-wide relief.



L. H. GIBSON

Announcement of the relief program did not meet with immediate enthusiastic response among the Engineers of the Division of Highways, but it must be stated that as soon as the work was started, knowledge gained of

the actual need of the men employed in the emergency, created great sympathy among all of the engineers and other employees of the Division of Highways, and it was only a short time before every individual was lending his utmost assistance to help the good work along. "Efficiency with Economy" is a rule rather than a slogan in the Division of Highways. Consequently it must be confessed that the expenditure of hundreds of thousands of dollars through the use of hand labor was at first viewed with some alarm.

With the exception of those men obtained through the State Employment Bureau at Sacramento and San Francisco, men employed in District V were hired only after submitting a signed questionnaire which detailed among other things the number of dependents; whether any other members of the family were contributing the support; the matter of sickness or disability in the family, and the period during which the individual had been without employment. References which might be used to verify statements in the questionnaire were also given. Innumerable applications for employment were made, and only those who showed the greatest need for employment were hired. It must be confessed plenty of those were found on the list.

Employment of the needy has continued through the Spring months. The character of labor furnished by these men has been excellent, and they have demonstrated that for the most part they appreciated the effort of the State to give them assistance. Men have not been allowed to shirk in any way, but are

expected to give their best efforts to the job to which they are assigned. On the other hand, the effort put forth by the individual is the chief consideration in his continued employment. No man was discharged because he can not do as much work as others in the organization. What counts is how he tries.

Most of the men employed on the maintenance crews were given three days employment per week which permitted of assisting twice as many men as would have been possible with the same funds had continuous employment been furnished.

Statistics compiled from the questionnaires of those employed were interesting. Throughout District V the number of dependents of each employee has averaged about four to the man, which means that for every man who was employed, five individuals were being clothed, housed and fed. Up to the present time District V has been taking care of about 600 of the so-called unemployed. This shows that the District has been caring for about 3000 individuals, each group of dependents receiving from \$250 to \$300 during the period employed. As District V is only one in ten highway districts in California, the extent of relief furnished by the Department of Public Works is readily seen.

FINAL PAYMENT

"Judge," said the contractor to his lawyer, "Doctor says I got about a month to live. I want to make my will.

"Fix it so my overdraft in the First National goes to my wife. She can explain it to them.

"My equity in my automobile I want to go to my son. He will have to go to work then to meet the payments.

"Give my unpaid bills to the bonding company. They took some awful chances on me and are entitled to something.

"That new-fangled machine on the job, I want the resident engineer to have. He made me buy it; maybe he can make it work.

"My retained percentage, give to the State. I never expect to get it, anyway.

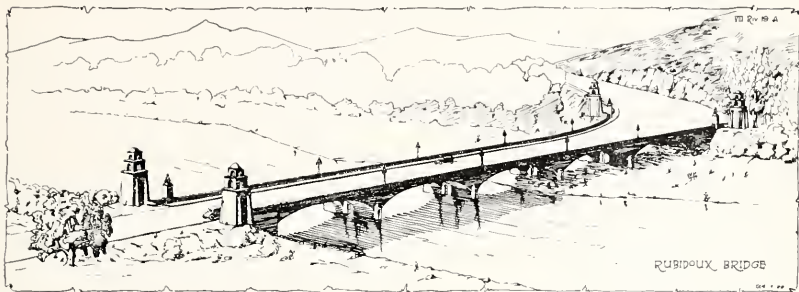
"My equipment, give to the junk man. He has had his eye on it for several years.

"My keg I want to go to my bootlegger. I hope it costs him as much to keep it wet as it has me.

"I want you to handle the funeral for me, Judge. Any undertaker will do, but I want these six material men for pallbearers. They have carried me long they might as well finish the job."

—Exchange.

The Rubidoux Bridge at Riverside



The rapid increase in quantity and speed of traffic carried by the Rubidoux bridge over the Santa Ana River in Riverside County has made it imperative that major alterations be accomplished on the structure. The existing bridge was built in 1923 by Riverside County. It consists of five earth-filled barrel arches with a total length of approximately 550 feet. The roadway is but twenty-three feet wide with no sidewalks. Due to the fact that the site of the bridge is adjacent to the city limits and provides a main entrance of Riverside, great care was taken to insure an architecturally beautiful structure. A perfect balance of arch dimensions combined with carefully selected decorative details of Spanish motif have secured this result. The bridge is amply strong to carry modern loads but has become dangerously narrow and is further antedated by a sharp fifty-foot radius curve approaching its eastern end.

Consideration of the problem by the Bridge Department early lead to the conclusion that it would be highly desirable to preserve the existing structure but increase its capacity by combining it with a duplicate bridge built to one side. This construction will also permit the substitution of an approach curve of five hundred feet radius with proper superelevation for the present hazardous fifty-foot radius curve. The new roadway will be forty feet wide and two five-foot sidewalks will be provided. The estimated cost of this change amounts to \$150,000.

As completed all the desirable details of the former bridge will be preserved while complete modernization will be realized. Architecturally the enlarged structure will not differ from the existing bridge and complete harmony of appearance will be maintained. The accompanying artists sketch illustrates the completed bridge.

SALE OF "RIGHT TO VIEW" PROPOSED AS BILLBOARD SOLUTION

(Continued from page 9.)

In such restricted sections exceptions are made for signs offering the property for sale or for products manufactured or grown on the premises.

Commenting on Mr. Nelson's bill which will be taken to the various organizations comprising the conference for official action by them, and possibly presented to the next legislatures in the various states, Senator Pepper said:

"This solution is novel but sound. Many interests have sought to have the police power of the state employed to protect highway beauty by forbidding commercial uses in

scenic spots. I doubt whether the police power will be regarded by the courts in the future as extending beyond the preservation of health and safety in this connection.

"Mr. Nelson's plan seems to me to be the most feasible one, first, because it is both just and effective, and second, because it does not make a demand upon the courts greater than they are likely to respond to. It looks to me as though this is the best solution yet produced. I wonder that no one thought of this way out before."

New highways across the jungles of British South Africa are dangerous to tourists, and one driver says he was chased by four leopards and two elephants. However, he probably escaped road hogs.—*Highway Topics.*

Clearing the Highways of Snow

By J. W. VIECKREY, District Maintenance Engineer, District Three *

PLOWING snow is perhaps the most spectacular operation in connection with maintenance. It appeals most vividly to the individual imagination for it creates a very beautiful picture when accomplished with a rotary plow, and it usually means the difference between an unusable and a usable road.

Snow removal operations, to provide access to the recreational areas, where a depth sufficient to permit winter sports can be assured, has expanded tremendously in the last three years. The consequent costs have gone up at about the same angle that the snowflake comes down. The increasing flow of traffic over the roads opened in a good index to the demand, and the continuous enthusiasm of



Showing result of fast thawing shortly after removal of snow near Donner Summit, 1931.

the thousands of snow sport devotees indicates that winter sports and snow frolics, at locations accessible to automobile traffic, have become a permanent part of California's list of recreations.

A Sunday traffic count made at the Auburn ski jump, when Route 37 was open only to Emigrant Gap, showed approximately 750 machines above the snow line. On February 15, the last day of the Truckee-Tahoe Dog Derby, there were approximately five hundred machines parked on the Truckee streets. Donner Summit was closed at the time. On February 22 there were about 1000 machines at Truckee and Tahoe City. The count going



Rotary plow on dual motor-driven four-wheel-drive truck, making first cut through two feet of snow, west of Soda Springs.

east over Donner Summit that day was between 450 and 500.

Snow removal work during the winter just passed below the 5000-foot contour was of very small consequence compared with a year ago. The snow equipment provided for such areas lay idle or was moved to higher elevations where the intensity of the storms, over a smaller area, made up any deficiency in the work to be done that may have seemed apparent when viewing the situation from the valley.

The first storm of the year began on Donner Summit on November 15, and during the night became a terrific blizzard driven by a 66-mile wind. Machines attempting to get



Rotary plow on four-wheel-drive truck, widening road-way through cut on Donner Summit, February, 1931.

* The pictures for this article were furnished by D. D. Greeley, Superintendent of Equipment.



Push plow on three-ton, four-wheel-drive truck, clearing roadway on Donner grade, February, 1931.



Dual motored four-wheel-drive truck with latest type rotary plow, breaking through plug just west of Donner Summit, February, 1931.

over the summit before it closed crowded in so fast that the snow plows could not operate efficiently. Any idea of keeping the road open had to be abandoned and all effort made to get out the stranded machines and occupants. At times the storm was so severe that a man could not walk through the summit cut. The maintenance men spent all one night and most of the next day getting people out of the storm. When the skies cleared on the 19th, there was five feet of snow piled up, and thirty machines were snowed in; some completely covered. The rotary plows were started again. The road was plowed out, the machines rescued, traffic was resumed, and steel gates installed on either side of the summit to prevent a recurrence.

The intensity and duration of the storms in this area have emphasized very emphatically the necessity of fast equipment for snow removal work. Experiences to date have indicated that successful and satisfactory snow removal is dependent on adequate equipment,

both quality and quantity, and that it must be designed for the locality in which it is to work.

Early in our snow removal work we discarded all tractor types of power because of lack of speed, and installed all plows on pneumatic tired trucks.

Light trucks with low moldboard plows handle the snow very satisfactorily below an elevation of 3000 feet. Above that elevation and up to 5500 feet heavier trucks with slightly higher plows are very effective, especially with a little assistance from a rotary to widen cuts. Above 5500 feet rotary plows and four-wheel drive trucks are employed practically all the time to widen trenches and dispose of windrows made by the push plows.

Each piece of equipment is kept very close to its assigned section during the entire snow season, and as soon as indications of an impending storm are apparent it is made



Dual motored four-wheel-drive truck with rotary plow, Donner Summit, 1930-31.



A typical snow fence.

ready for snow work. When the snow reaches a depth of four inches on the sections below 5500 feet the plows are started and operations carried on continuously for the duration of the storm. The gates are closed and locked and watchmen go on duty to prevent machines attempting the higher elevations. After the storm the road between the gates is cleared and traffic resumed. Barometers are kept at all maintenance stations in the snow area as an aid to determining weather conditions.

The work is very strenuous and none except the men who are accustomed to cold and severe weather can stand the strain. On the night shifts the conditions are very severe indeed, and it is not practical to attempt to operate

Snow Surveys Show Increasing Danger of Water Shortage

ALTHOUGH the principal snow surveys as a basis for run-off estimates were made in late March and early April and reported in the April 1 bulletin, additional surveys have been made in late April and early May at the key snow courses to furnish information for possible modification of earlier estimates and to indicate the extent of melting since April 1. These later surveys complete the seasonal record of monthly surveys, February to May, for the key snow courses.

The average precipitation to May 1 in per cent of normal to May 1 is about as follows for the various stream basins: Upper Sacramento, Pit, McCloud, Feather, and Yuba, 58 per cent; American, 60 per cent; Mokelumne, 64 per cent; Stanislaus, 72 per cent; Tuolumne, 65 per cent; Merced, 57 per cent; Mono, 57 per cent; Upper San Joaquin, 51 per cent; Owens, varying from 44 to 59 per cent; Kings, Kaweah and Kern 62 per cent, and Los Angeles, San Gabriel and Santa Ana from 65 to 80 per cent.

The lack of normal precipitation in April warrants a downward modification of the estimates given on April 1 for seasonal run-off. The estimated seasonal run-off for the Upper Sacramento River is reduced to 34 per cent or 2 per cent less than that of 1924; for the entire Sacramento Basin, including tributaries, the revised estimate is 30 per cent or the same as 1924, and for the entire Sacramento-San Joaquin drainage, including tributaries, 30 per cent or 2 per cent above the 1924 percentage. With a larger rice acreage in the Sacramento Valley than in 1924, these data indicate for the valley and delta even more severe conditions of water supply than in that year, and a corresponding salinity encroachment in the delta area equaling or possibly exceeding the 1924 invasion.

The Soviet government of Russia plans to spend one and a quarter billion dollars on the construction of 5,000,000 miles of roads during a five year period, largely under the direction of 38 American highway specialists.

of 1928 and 1929 there was expended in the district less than \$3,000 plowing snow; during the 1929-1930 season the cost reached \$13,500 and during 1930-1931 it will probably exceed \$18,000.



Dual motored four-wheel-drive truck with rotary plow operating east of Soda Springs, near Donner Lake summit, February, 1931.

equipment which does not provide an enclosed cab and the very best lights. The trucks at Truckee have come in off the night shifts with icicles twelve inches long hanging inside the cabs, and a solid mass of ice extending from the radiators to the plows. It has been estimated that the trucks have come off shift at times carrying from two to two and one-half tons of ice.

Steam-heated truck sheds are provided at the maintenance yards in the higher elevations, and an adequate supply of hot water is always available. The trucks are cleaned of ice and serviced at the end of each shift, and between storms they are thoroughly checked over and necessary adjustment made to prevent breakdowns on the road.

The demand for open roads is rapidly extending the snow removal work to all routes leading into the Sierra Mountains that are surfaced to withstand winter traffic, and is rapidly becoming a major item of traffic service.

The costs are increasing as rapidly as the service is being extended. During the winter

Comparative Data Show California Hospital Building Costs Reasonable

HOW DO California's costs for institutional buildings for the insane compare with those of other states?

New York recently started an investigation of the relative costs among the states of the buildings in which the insane are housed. In the course of this investigation, Governor Rolph was asked regarding these costs in California.

This information was supplied by State Architect George B. McDougall, chief of the Division of Architecture, Department of Public Works. The figures were based upon costs of buildings recently constructed to modern standards of hospitalization for the insane.

On opposite page are comparative figures.

The institutions upon which California's figures are based were the Norwalk Receiving Building, built in 1926; wards 15 and K of the Mendocino State Hospital, built in 1930; the custodial unit of the Mendocino State Hospital, built in 1928, which houses disturbed patients; the Norwalk Nurses Home, built in 1928, and the Pacific Colony Employees building, built in 1928. These buildings are all of fire-resistant construction. Meals in these buildings are served from a central kitchen.

In acknowledging the receipt of the information furnished by State Architect McDougall, Fred K. Stuart Greenes, Superintendent of the Department of Public Works for the State of New York, wrote as follows:

Reception Building

	Capacity	Patient beds	Dining room	Kitchen	Clinic	Patient cost
Delaware.....	40	Yes	Yes	No	Yes	\$4,500 00
Illinois.....	700	Yes	Yes	Yes	Yes	3,000 00
Michigan.....	300	Yes	Yes	Yes	Yes	2,400 00
Pennsylvania.....	61	Yes	Yes	Yes	Yes	5,100 00
California.....	162	Yes	Yes	Yes	Yes	1,235 00
New Jersey.....	250	Yes	Yes	Yes	Yes	4,598 00
New York.....	150	Yes	Yes	Yes	Yes	2,780 00

Able-Bodied Custodial Building

	Capacity	Patient beds	Dining room	Kitchen	Patient cost
Delaware.....	60	Yes	Yes	Yes	\$2,584 00
Illinois.....	800	Yes	Yes	Yes	1,500 00
Massachusetts.....	156	Yes	Yes	No	1,150 00
Michigan.....	262	Yes	No	No	850 00
California.....	579	Yes	Yes	No	579 00
New Jersey.....	92	Yes	Yes	Yes	1,792 00
New York.....	400	Yes	Yes	Yes	1,290 00

Disturbed Custodial Building

	Capacity	Patient beds	Dining room	Kitchen	Baths	Patient cost
Massachusetts.....	86	Yes	Yes	No	Yes	\$1,750 00
Illinois.....	300	Yes	Yes	Yes	Yes	2,500 00
Michigan.....	300	Yes	Yes	Yes	Yes	2,400 00
Pennsylvania.....	1,240	Yes	Yes	Yes	Yes	1,240 00
California.....	66	Yes	Yes	No	Yes	2,045 00
New York.....	260	Yes	Yes	Yes	Yes	2,480 00

Employees Building Ward Attendants

	Capacity	Bed rooms	Reception	Laundry	Dining room	Kitchen	Room cost
Massachusetts.....	70	Yes	Yes	No	No	No	\$1,560 00
Illinois.....	100	Yes	Yes	Yes	Yes	Yes	1,500 00
Michigan.....	207	Yes	Yes	Yes	Yes	Yes	1,000 00
Pennsylvania.....	46	Yes	Yes	Yes	Yes	Yes	2,560 00
California.....	28	Yes	Yes	No	No	No	1,600 00
New Jersey.....	252	Yes	Yes	Yes	Yes	Yes	1,328 00
New York.....	100	Yes	Yes	Yes	Yes	Yes	1,480 00

NOTE.—All buildings are of fire-resistant construction.

Reconstruction Problems and Projects On Redwood Highway

By F. W. HASELWOOD, District Engineer

THE REDWOOD HIGHWAY extending from San Francisco to the Oregon line is approximately 324 miles in length. About 140 miles from San Francisco the highway crosses Ridgewood Summit, the divide between the Russian and the Eel River drainages. From this divide the highway follows the Eel River or its tributaries for 135 miles. This portion of the Redwood Highway and the country it traverses are unique in many respects.



F. W. HASELWOOD

While redwood trees are found in other portions of the State they are first encountered on the Redwood Highway on this unit about forty-five miles north of Willits. For nearly seventy-five miles this highway traverses an area in which redwoods abound. The longest continuous stretch of road through redwood forests is from Miranda to near Scotia along the South Fork of the main Eel River, a distance of about twenty-eight miles. In this area are found the finest groves of redwood in existence, both as to size and quality of trees.

From Ridgewood Summit the Redwood



View of Road winding through a Redwood Grove

Highway drops on an easy grade to Willits in the center of Willits Valley and follows Outlet Creek about thirteen miles to Longvale; thence up Long Valley Creek to a low divide near Laytonville, and down Ten Mile Creek to about eight miles north of Laytonville. Here the highway climbs about two miles to Rattlesnake Summit from which it follows Rattlesnake Creek for about ten miles and then the South Fork and the Eel River, leaving the drainage at Loleta, opposite the mouth of the river.

For the greater part of the 135 miles this highway traverses mountain areas. The Coast areas of California are, geologically



View of State Highway through a Redwood Grove



Another View of the Same Highway

speaking, quite young. In the process of upheaval the strata were very badly broken and the texture of the formation was thoroughly disorganized. Formations encountered are largely sedimentary of clay or sandstone and contain little rock of volcanic origin. Some sandstone that has been altered by heat and occasional intrusions of igneous rock are encountered. In general, however, even rock formations are soft and badly faulted. This soil characteristic together with the heavy rainfall contributes to the instability which is universally manifested by a tendency of the country to slide when excavations are made, or by inherent structural weakness which frequently results in its failure by slipping or rupture and displacement when loaded with a heavy embankment. Slide removal and fill stabilization are among the major maintenance activities of District I. Reconstruction to higher standards can not do other than greatly increase the difficulties resulting from this inherent structural weakness of the country itself and the unusual climatic conditions that prevail.

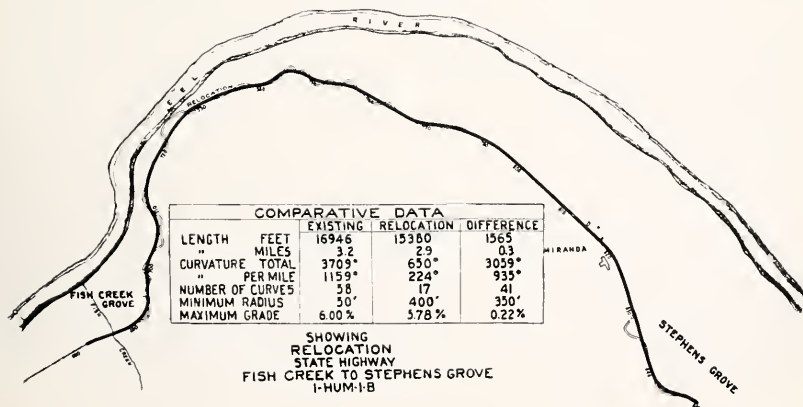
The original construction of this 135 miles was accomplished during the period from 1912 to 1920. This was during a period of severe financial limitations and when traffic density and the sparsely populated areas traversed were rather weak arguments for the major expenditures necessary for a modern highway through such a country. Consequently on initial construction length of improvement was the major consideration. From 1920 to 1929 work on this highway consisted of increasing its capacity by widening and improving its surface. It was in 1929 that the traveler first found it dust free.

PROGRESS OF WORK

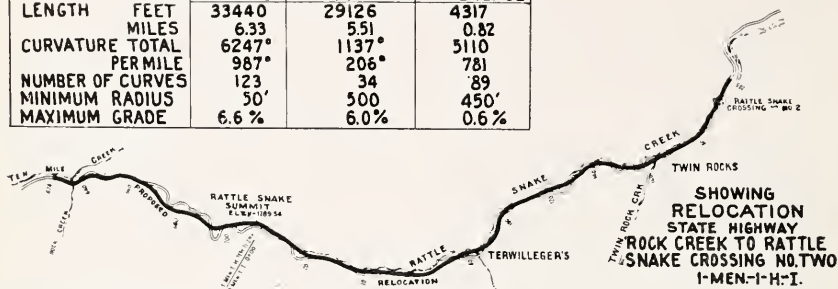
Up to 1929 limitation of funds and the necessity of completing unimproved gaps between Eureka and the State line prevented the initiation of any major reconstruction program on this section of highway. In the biennium beginning in 1929 four units aggregating 7.7 miles were reconstructed to present standards of alignment with asphalt treated crushed rock surfaces. These sections rather widely scattered are near Miranda, Hartsooks, Garberville and Red Mountain Creek north of Lane's Redwood Flat. The structural condition of the road and the inferior quality of traffic service it afforded were the reasons for their selection. Similar reasons dictated the selection of the 8.4 miles to be reconstructed in the biennium beginning this year. This process of selecting reconstruction projects unfortunately does not result in any continuous stretch of high quality road and on its face does not appear to constitute a well ordered program. However, as the units selected by this method are so outstanding in their comparative inferiority it is not probable that any other plan can be followed for several years.

MAGNITUDE OF PROBLEM

The magnitude of the reconstruction problem in District I may be visualized from a consideration of the cost of improvement. Approximately five and three-quarter millions of dollars must be spent on the reconstruction of this 135 miles, about one-fourth of the mileage in the district, to bring it to proper standards of alignment, grade and width before the placing of permanent pavement is justified. The obvious relief from such a



COMPARATIVE DATA				
LENGTH	FEET	EXISTING	RELOCATION	DIFFERENCE
		33440	29126	4317
	MILES	6.33	5.51	0.82
CURVATURE	TOTAL	6247°	1137°	5110°
	PER MILE	987°	206°	781°
NUMBER OF CURVES		123	34	89
MINIMUM RADIUS		50'	500'	450'
MAXIMUM GRADE		6.6 %	6.0%	0.6 %



dilemma is in a lesser degree to continue the improvement of the traffic service on the mileage, which can not be immediately included in major reconstruction projects, by widening the grade, removing sharp points, widening shoulders and improving the surface. This activity serves to balance what otherwise appears to be a crazy quilt method of reconstruction. In the biennium beginning in 1929 eighteen miles of this section of highway were so improved and in the biennium beginning in 1931 thirty miles will be so improved. By such a program improvement in traffic service will be constantly apparent throughout whatever period is required for complete reconstruction.

FUTURE PROGRAMS

Future programs therefore for this section of the Redwood Highway will continue the custom of containing one outstanding major project, several projects of lesser magnitude but nevertheless of outstanding necessity and supplemental development of the facilities of those portions not yet reachable as major projects.

In 1929 the major reconstruction project consisted of improving three miles between Fish Creek and Stephens Grove near Miranda about fifteen miles north of Garberville. The following comparisons offer ample justification for the selection of this unit as a major project.

	Existing road	Relocation	Difference
Length, feet -----	16,946	15,380	1,565
Length, miles -----	3.2	2.9	.3
Curvature, total -----	3769°	650°	3659°
Curvature, per mile -----	1159°	224	935°
Number of curves -----	58	17	41
Minimum radius -----	50'	400'	
Maximum grade -----	6%	5.78%	.22%

This unit was reconstructed to a graded width of twenty-eight feet with four-foot side

ditches in cuts. Surfacing was eight inches of crushed gravel with a light bituminous surface. Excavation quantities were 217,750 cubic yards or 75,000 cubic yards per mile and the gross cost was \$162,700 or \$56,000 per mile. It has for some time been the practice to remove all construction slashings and roadside debris and leave the roadsides clean and attractive. On this project was initiated the practice of restoring by appropriate planting those unused areas of the old roadway or of daylighted cuts and in some cases fill slopes. This method of treating the landscape scars resulting from construction activities greatly supplements and hastens the healing processes of nature and contributes much to the roadside beauty.

1931 RECONSTRUCTION PROGRAM

The major reconstruction project for 1931 consists of 5.5 miles improving what is known as the Rattlesnake grade. This includes the two-mile rise from Ten Mile Creek to Rattlesnake Summit and 3.5 miles down Rattlesnake Creek.

The following comparisons illustrate the qualifications of this unit as a major reconstruction project:

	Existing road	Relocation	Difference
Length, feet -----	33,440	29,126	4,317
Length, miles -----	6.33	5.51	0.82
Curvature, total -----	6247°	1137°	5110°
Curvature, per mile -----	987°	206°	781°
Number of curves -----	123	34	89
Minimum radius -----	50'	500'	
Maximum grade -----	6.6%	6%	0.6%

It will be noted that in addition to a 13 per cent saving in distance there is a reduction in curvature equal to 2.2 complete circles per mile. Thus is the traveler enabled to save time safely.

Let's make this a nineteen thirty-won!

Text of Supreme Court Decision In San Francisco Bay Bridge Case

Reprinted from California Decisions, April 24, 1931

In the matter of the controversy between California Toll Bridge Authority and the City and County of San Francisco (a municipal corporation) on the one part, proponents, vs. Benning Wentworth, as Auditor of the City and County of San Francisco, on the other part, respondent.

Application for writ of mandate prayed to be directed to respondent as Auditor of the City and County of San Francisco to compel him to audit and approve a demand for preliminary expenses in connection with the construction of a bridge across the bay of San Francisco. Writ granted.

For Proponent California Toll Bridge Authority—U. S. Webb, Attorney General; Robert W. Harrison, Chief Deputy Attorney General; Frank English, Deputy Attorney General.

For Proponent City and County of San Francisco—John J. O'Toole, City Attorney; John J. Dailey; C. C. Carleton, of counsel.

For Respondent—Frank L. Fenton.

The California Toll Bridge Authority, created by act of the Legislature (Stats. 1929, chap. 763, p. 1489), has obtained an alternative writ of mandate requiring the respondent, as Auditor of the City and County of San Francisco, to audit and approve, or show cause why he should not audit and approve, a demand for the sum of \$5,000, which amount, it is alleged, has been appropriated by the Board of Supervisors of the city and county for the purpose of aiding in meeting the necessary costs of making a survey and preparing plans, specifications and estimates for the construction of a bridge across San Francisco Bay between San Francisco and Oakland. A demand in due form for the sum of \$5,000 was presented to the Auditor, who refused to approve the claim on the ground that the appropriation is an illegal and unlawful appropriation of public funds, because it is in "aid of defraying preliminary expenses leading up to an issue of so-called revenue bonds to the extent of many millions of dollars under purported authority" of the act of the Legislature above referred to, and therefore a violation of section 1, article XVI, of the State Constitution, which provides in part: "The Legislature shall not, in any manner, create any debt or debts, liability or liabilities, which shall, singly or in the aggregate, with any previous debts or liabilities, exceed the sum of three hundred thousand dollars, except in case of war to repel invasion or suppress insurrection," without first submitting the particular proposition to a vote of the people.

The act in question, which marks a complete departure from the old system of constructing and acquiring toll bridges in connection with the State's highways, declares it to be the policy of the State of California to acquire and own all toll bridges situated upon or along any part of the highways of the State, with the end in view of ultimately eliminating all toll charges thereon. It creates the California Toll Bridge Authority, a public agency of the State, the members of which are the Governor, Lieutenant-Governor, Director of the Department of Public Works, Director of the Department of Finance and the chairman of the

California Highway Commission. The Authority has power under the act, operating through the Department of Public Works, to build or acquire toll bridges and other toll highway crossings in the name of the State of California. When the Toll Bridge Authority determines to build or acquire such toll bridges, it may authorize the issuance, in its own name, of revenue bonds to provide the funds for such acquisition or construction, and fix the rates or tolls on such bridges, and in doing so shall give due consideration to the cost of operating and maintaining the bridges, and the amount required to meet the bond obligations. The toll so fixed shall never be less than sufficient to meet the operating expenses and the bond obligations. Bonds issued under the provisions of the act "shall not constitute or be a debt or general obligation of the State, and the payment of both principal and interest of all such bonds shall be secured only by the tolls or other revenues collected from the particular bridge or bridges or other toll highway crossings for which such bonds were issued, and shall be paid from such tolls or revenues, or from such other contributions or appropriations as may be made available under the terms of this act." (Sec. 10.) The bonds must contain on their face a recital to this effect.

Finally, it is provided that political subdivisions of the State mentioned in the act may, upon the request of the Department of Public Works, or of the Authority, advance or contribute money, rights of labor, materials, and other property, toward the expense of building, acquiring, and maintaining the bridges, and for preliminary surveys and the preparation of plans and estimates of cost therefor, and other preliminary expenses. It was under this provision that the Board of Supervisors of the City and County of San Francisco, by resolution, appropriated the sum of \$5,000, which is the subject of the controversy now before the court.

Following the enactment of the statute, the President of the United States and the Governor of California appointed a commission, known as the "Hoover-Young San Francisco Bay Bridge Commission," to make a study of State and interurban traffic needs across the San Francisco Bay, with due regard to the needs of national defense and navigation. This commission rendered its final report and recommendation to the President and to the Governor, and the Department of Public Works, at the request of the commission, made its report and recommendation of a bridge site to the California Toll Bridge Authority, which latter body approved the recommendation and authorized and directed the Board of Public Works to make the necessary surveys and to prepare plans, specifications, and estimates for a bridge across San Francisco Bay as recommended. The Board of Public Works then made a request of the City and County of San Francisco that it contribute funds in aid of the cost of making the necessary surveys and preparing the plans, specifications, and estimates for the bridge, and it was in response to that request that the resolution appropriating \$5,000, payable to the Toll Bridge Authority, was adopted by the Board of Supervisors,

and the claim thereunder presented to the Respondent Auditor for approval, which approval the Auditor refuses to give.

(1) Respondent's objection rests mainly upon the finding of the Department of Public Works, in its recommendation to the Toll Bridge Authority, that the cost of the proposed bridge will be in the neighborhood of \$75,000,000. Therefore, he contends, the issuance of revenue bonds to that amount is not only greatly in excess of the \$300,000 limit placed by the Constitution, but the bonds, if issued, will constitute debts or liabilities of the State of California not authorized by vote of the people.

We are of the view that the language of section 10 of the act already quoted completely disposes of the question now before us, and that the contention of the respondent can not be sustained. The overwhelming weight of judicial opinion in this country is to the effect that bonds, or other forms of obligation issued by states, cities, counties, political subdivisions, or public agencies by legislative sanction and authority, if such particular bonds or obligations are secured by and payable only from the revenues to be realized from a particular utility or property, acquired with the proceeds of the bonds or obligations, do not constitute debts of the particular state, political subdivision, or public agency issuing them, within the definition of "debts" as used in the constitutional provisions of the states having limitations as to the incurring of indebtedness. The decisions we shall presently cite clearly establish that to be so.

While this court has had little occasion to consider the "revenue bonds" method of financing public utilities and structures, there is some precedent in this State, and we are not without ample authority from other sections of the country, where the question has, on repeated occasions, engaged the attention of other courts of last resort, notably, New York, West Virginia, Alabama, Kentucky, and Arkansas. We deem it only necessary, in support of the conclusion we have reached, to quote from the opinions of the courts in those states, and from our own decisions.

The legislature of the state of New York created the Port of New York Authority under a compact entered into between that state and the state of New Jersey. A district was created embracing the greater portion of the city of New York and a part of New Jersey across the Hudson River, and New Jersey passed a similar act relative to the construction of toll bridges across the navigable waters between the two states. These acts provide that the money needed for the construction of the bridges and incidental purposes "shall be raised by the Port Authority on its own obligations, secured by the pledge of the revenues and tolls arising out of the use of the bridges.

As security for obligations so issued and moneys so appropriated, the revenues and tolls arising out of the use of said bridges shall be pledged to the repayment of the entire issue of bonds and other securities for the construction thereof, together with interest, and the repayment of the moneys appropriated by the state; it being the declared policy of the state that the said bridges, so far as the payment of the bonds or other securities issued for the construction thereof, together with the repayment of the moneys advanced by the state, shall in all respects be self-sustaining." By agreement of the two states, the legality of such an organization as the Port Authority, and the validity of its bonds, was submitted to the Honorable Charles Evans Hughes, then practicing law in New York, and now the Chief Justice of the Supreme Court of the United States. After a close study of the provisions of the act and an examination

of the authorities, Mr. Chief Justice Hughes gave as his opinion that "this legislation places upon the Port Authority the duty to provide adequate tolls and charges for the purpose described, and the performance of this duty may be compelled by any court of competent jurisdiction." While the opinion of the learned Chief Justice does not have the force of judicial precedent, it does express the opinion of a very distinguished lawyer and an eminent jurist.

We are not, however, left without the decisions of the highest courts of several states on the exact question.

(Here follows a discussion of decisions in cases arising in West Virginia, Alabama, Kentucky and Arkansas.)

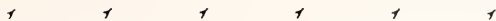
This court has not heretofore had occasion to pass directly upon the question whether or not revenue bonds secured only by the revenues of a particular utility acquired with proceeds of such bonds constitute a debt or liability in violation of section 1 of article XVI of the State Constitution, but a consideration of the exact principle involved in the case now before the court will be found in the opinion in the case of *Shelton vs. City of Los Angeles*, 206 Cal. 544, 275 Pac. 421. The water and power commission of the city of Los Angeles proposed to issue certain obligations termed short-term notes, under authority of a charter provision, the notes to be paid solely out of water revenues of the commission. In seeking to enjoin their issuance, a taxpayer claimed that the obligations, when issued, would constitute an indebtedness of the city itself, and one incurred in violation of section 18 of article XI of the State Constitution forbidding the contraction of an indebtedness by a municipality in any such manner. This court held (p. 552) that the short-term notes would not be premises on the part of the city of Los Angeles, but would constitute acknowledgments of indebtedness on the part of the department of water and power, under which the city would not be bound to do anything which might be enforced by action, there being no liability on the part of the city in the premises. In that opinion this court distinctly recognized the fact that "the incurring of such indebtedness has been held elsewhere not to be violative of a constitutional provision such as our own section 18 of article XI," citing cases, some of which have been discussed in this opinion.

The respondent auditor specified a large number of objections when asked to approve the claim for the \$5,000 appropriated by the board of supervisors. What we have already said disposes of the main objection raised; in fact is fairly determinative of all the points raised. [2] But, it is argued, the Legislature can not lawfully delegate to a subordinate body or board, such as the California Toll Bridge Authority, the right to pledge the earnings or revenue derived from property belonging to the State without approval of the Legislature or without specific approval by the voters of the State. It has not done so. The act creating the Toll Bridge Authority, and providing for the cost of the construction of toll bridges through the revenue-bonds method of financing, pledges the earnings and revenue derived from the bridge, when earned, as security for the payment of the bonds, without any liability resting on the State, and merely creates a subordinate administrative body to carry out a declared legislative purpose. (*Bates vs. State Bridge Commission*, supra.)

[3] While the parties to the controversy sought to submit it to the court without action, under the provisions of sections 1138 to 1140 of the Code of Civil Procedure, we have elected to treat it as an application for a writ of mandate, following our action in

(Continued on page 21.)

Grade Crossing Study is Inaugurated



PLANS FOR a study of the grade crossing situation in California that will cover every phase of the subject were discussed at the meeting of the Commission held in Sacramento on May 12 by Colonel Walter E. Garrison, Director of the Department of Public Works, and the members of the California Highway Commission. The study is being undertaken in accordance with a bill passed by the present Legislature and signed by Governor Rolph. It will be made cooperatively by the Department of Public Works and the California Railroad Commission.

The study will include railroad grade crossings built both upon the State and the county highway systems.

Following the conference, C. H. Purcell, State Highway Engineer, was instructed to immediately proceed in cooperation with the State Railroad Commission to gather data showing the number and location of all railroad grade crossings in California; the approximate railroad and automobile traffic at these points; protective warning designs now installed; the accident record of each of these crossings.

With this data, it is believed that a program of grade crossing eliminations can be formulated that will make possible the early removal of all dangerous crossings from all roads in the State, and the eventual removal of all crossings, other possibly than spur tracks in more or less isolated districts.

The thorough character of the study that is contemplated is indicated by the fact that its cost is estimated at \$50,000. The report will be submitted to the Legislature at its session in 1933.

Commenting on today's conference, Earl Lee Kelly, chairman of the California Highway Commission, said:

"We are going to know by 1933 just how extensive the grade crossing problem is in California. We know what this problem is in our State highway system, and are making very rapid progress in the elimination of these crossings for the State system. There has not been the careful survey made of crossings on county roads and city streets.

"It has been said that the complete elimination of railroad grade crossings in California

would cost a billion dollars. Before the next Legislature meets, we will know what this cost is, and will not have to guess at it. Moreover, we will know the practical method of proceeding to eliminate them, whether by relocation of railroad or highway, or by building underpass or overpass separation structures.

"We will also know how to better the protection of such crossings as can not be immediately eliminated.

"I feel that the bill for this study as signed by Governor Rolph constitutes a determined effort to solve the grade crossing problem in California, and marks a long step forward in the Rolph highway program."

TEXT OF SUPREME COURT DECISION IN SAN FRANCISCO BAY BRIDGE CASE

(Continued from page 20.)

In re City and County of San Francisco, 195 Cal. 426, 233 Pac. 965.

Therefore, let a peremptory writ of mandate issue to the respondent, as Auditor of the City and County of San Francisco, directing him to audit and approve the demand of the petitioner, California Toll Bridge Authority, for the sum of \$5,000, duly appropriated by the Board of Supervisors of the City and County of San Francisco, as set forth in the petition.

WASTE, C. J.

We concur:

SEAWELL, J.
CURTIS, J.
SHENK, J.
RICHARDS, J.
LANGDON, J.
PRESTON, J.

It takes a little courage,
And a little self-control,
And some grim determination,
If you want to reach a goal.
It takes a deal of striving,
And a firm and stern-set chin,
No matter what the battle,
If you're really out to win.—Anon.

"How bashful you are," a pretty girl said to a young man.

"Yes, I take after father in that respect," he said.

"Was your father bashful?"

"Was he? Why, mother says if father hadn't been so darn bashful I'd be four years older."

Good men never see temptation when they meet it.

Construction Records Made in 1930 on California State Highway System

By EARL WITHCORBE, Assistant Construction Engineer

The accomplishments of the 1930 construction program which are enumerated in the following tables indicate the progress made in better highway construction by the California Division of Highways. The following results were obtained on the outstanding projects:

PORTLAND CEMENT CONCRETE

Record for smoothness was shared by two projects. Resident Engineers, W. J. Calvin and T. W. Voss; contractors, W. F. Peck Co., at Liberty Grade in Los Angeles County and Cornwall Construction Co., one-half mile north of Santa Maria in Santa Barbara County.

Record for average concrete strength. Resident Engineer, H. B. Lindley; contractor, Matich Bros., San Clemente to San Onofre in San Diego County.

Record for cement control. Resident Engineer, T. W. Voss; contractor, Cornwall Construction Co., one-half mile north of Santa Maria in Santa Barbara County.

Record for daily yardage. Resident Engineer, F. A. Read; contractor, Jahn & Bressi, between Balboa Avenue and Torrey Pines Road in San Diego County.

ASPHALTIC CONCRETE

Record for smoothness was shared by three projects. Resident Engineers, W. T. Rhodes on the first project and H. B. La Forge on the other two; contractors, California Construction Co., between Pixley and Tipton in Tulare County, and Peninsula Paving Co., between Fowler Switch Canal and Fancher Creek and through Fowler, both in Fresno County.

Record for best hand-finished work. Resident Engineer, L. R. McNeely; contractor Ed Johnson & Sons, between Pier Avenue and Gould Lane, Hermosa Beach, in Los Angeles County.

Record for density of pavement surface shared by two projects. Resident Engineer, H. B. La Forge on both projects; contractor, Peninsula Paving Co. on both projects, between Fowler Switch Canal and Fancher Creek, and through Fowler, both in Fresno County.

Record for stability of pavement surface. Resident Engineer, J. M. Lackey; contractor, Griffith Co., between Citrus Avenue and Glendora in Los Angeles County.

Record of production. Resident Engineer, H. B. La Forge; contractor, Peninsula Paving Co., between Fowler Switch Canal and Fancher Creek in Fresno County.

SUMMARY OF 1930 PAVEMENT CONSTRUCTION

Riding quality was decidedly improved on asphaltic concrete pavement, while the average smoothness for Portland cement concrete increased slightly.

The outstanding accomplishment of the year was the decided increase in average daily production of both types of hard sur-

face pavement mixtures. The average daily output for Portland cement concrete pavement mixers was 319.2 cubic yards, and the average daily output for asphalt concrete paving plants was 582.9 tons.

The record for average daily production of Portland cement concrete per mixer has been increased from 361.6 cubic yards in 1929 to 427.3 cubic yards in 1930. In figuring these averages, each calendar day worked is treated as a full day regardless of the number of hours the equipment was operated. This record represents 92.9 per cent of the maximum output that could have been secured had there been no delays.

The record daily average of asphalt concrete tonnage has been increased from 790.7 to 1040.9 tons, which represents 89.7 per cent of the maximum obtainable without delays.

PRODUCTION COMPARISONS

A study of the riding qualities obtained on high production projects discloses very interesting comparisons and thoroughly explodes the old established theory that speed on a paving job necessitated a sacrifice in smoothness of the finished pavement.

The five Portland cement concrete paving projects having average daily production in excess of 350 cubic yards, totaling 25 miles of pavement, show an average roughness of but 6.1 inches per mile as compared to the general average for the year of 8.9 inches per mile.

The five asphalt concrete paving projects having average production in excess of 600 tons, totaling 35.1 miles of pavement, show an average roughness of but eight inches per mile as compared to the general average for the year of 10.6 inches per mile.

With such a comparison, the Construction Department does not hesitate to urge all employees of the department to cooperate with the contractor in every way, without sacrificing the interests of the State, to increase the production on the job. The department feels that our contractors will readily appreciate the efforts made in their behalf to increase production and will voluntarily equip their jobs with machinery and labor to handle

adequately the increase, thereby resulting in a better quality of work.

PORTLAND CEMENT CONCRETE PAVEMENTS

Mix. Cement content was held uniformly to six sacks per cubic yard of concrete in place except for special cases where additional cement was used to effect early hardening. The aggregate mixture was designed by the maximum density method which has been in use by this department since 1925.

Design. The thickness of the pavement section was increased from six inches to seven inches in the center portion of slab, early in 1930, the edge thickness remaining at nine inches. The details relating to reinforcing steel and joint interval remained the same as the 1929 standards. A modification of this design was used in a few instances to fit local conditions.

Construction. Methods of proportioning remained the same as in 1929.

Ten-foot width construction was generally followed during 1930 although a few of the projects were built in twenty-foot widths with a longitudinal weakened plane center joint.

Experiments with methods of finishing brought out a ten-foot ribbed, one-man float for final finishing, replacing the two-man operated light finish float. This float seems to insure an average riding job with less effort than under former methods. This device was developed by Assistant Resident Engineers W. T. Lamb and H. D. Johnson on Contract 27VC4, in Los Angeles County.

Results of Tests. The average compressive strength of concrete used in pavements during 1930 was 4942 pounds per square inch. This represents 33 projects, and of these projects 19 were selected by headquarters representatives to cast a special series of cylinders for 28-day comparisons. The average strength from the job cylinders for these projects was 4920 pounds per square inch, as compared to 5470 pounds average for the casts made by headquarters.

The 1930 general average for all the projects shows an increase of slightly more than 1000 pounds per square inch compressive strength at 28 days over the average for 1929. Likewise the casts made by headquarters representatives show an increase in 1930 of more than 1000 pounds over 1929. The uniformity of the breaks within the individual projects is marked in comparison with previous years and is attributed to the exercise of more care in fabricating and curing. The decided increase in average strength is attributed to the fact that the samples are all reduced before casting to a common maximum size of aggregate compatible with the size of specimen by passing all of the mixture through a one and one-half inch square opening screen.

ASPHALTIC CONCRETE

Mix. Mixtures are designed and controlled largely by stability tests of the mortar content.

Many substitutes for limestone dust have been used during the past year, approval thereof being based on these stability tests. The substitute filler is tested in combination with the fine aggregate proposed for use on the project and compared with a mixture of the same aggregate with limestone dust. If the substitute develops strengths equal to the limestone dust mixture it is approved for use on the individual project.

Design. Thickened edges on both new base and resurfacing has become standard practice. Surface course has been standardized at two-inch thickness. On new grade a uniform base course five inches thick with thickened edges is used, while on resurfacing

jobs the widening is placed with thickened edges of base course mixture, then brought up to within two inches of grade with a leveling course mixture.

Commercial filler is not required in either base or leveling course mixtures. In surface mixtures 8 per cent of the dry aggregate consists of limestone dust or a suitable substitute—the amount of the latter being determined on the basis of comparison with the 8 per cent of limestone dust.

Construction. The average capacity of mixing plants has not been materially increased during the past year. The marked increase in the production of asphalt concrete tonnage is due to greater efficiency in plant operation, and the handling of this increased quantity on the street is made possible by the use of mechanical finishers. As an illustration of the progress made along this line, it was suggested to the Peninsula Paving Co. on their contract 26EC3, Fresno 4-A,B, that a positive timing device on the mixing platform might add to the uniformity of mixing time and also increase production. A Koehring timing device was immediately purchased, being taken from a new concrete mixer and installed on the asphalt plant so as to operate coincidentally with the dump lever on the aggregate weigh box. The increase in production obtained was an incentive to other contractors and the timing device has since become a part of the equipment on most asphalt plants. This same contractor was operating a comparatively new 4000-pound pug mill mixer that required 14 to 15 seconds to discharge. At the end of the 1930 season this mixer was scrapped and something more than three thousand dollars was spent on a new mixer with a discharge gate having a much greater area of opening for this season's work in an attempt to save time lost in discharge and to increase production. The new mixer has been in use but a few days and with the increase in production shows a net profit of better than two hundred dollars per day over the performance of the discarded mixer on last year's work.

TABLES

The tables of the 1930 construction are complete in that they include all types of projects constructed by contract during the year, and are a true index of each district's accomplishments. In addition to the Portland cement concrete and asphalt concrete pavements above described, these tables include yearly comparisons by districts and roughness records on bituminous macadam, plant oil mix, road oil mix, and armor coat surfacing, built under supervision of the Construction Department.

For Tables of 1930 State Highway Construction Records, see page 30.

LONDON—Introduction recently of London's first traffic light at Ludgate Circus and Fleet street caused the worst traffic jam ever known at that intersection when thousands of people jammed the streets and were crowded into the roadway to view the apparatus.

To keep even with the sheriff is better than to "get even" with a competitor.

A well-regulated husband is one who can't pass a mail box without feeling in his pockets.

Analysis of Motor Vehicle Accidents Occuring During March in California

CALIFORNIA MOTORISTS reported 2808 accidents for the month of March, 1931, in which 3781 persons were injured and 196 killed. March accidents increased 345 (14%) over March, 1930; the total injured increased 528 (16.23%) and fatalities increased 26 (15.29%).

The total of March accidents is 438 accidents greater than the total reported in February this year. The mean average number of accidents daily in February this year was 84.6; the mean daily average in March was 90.6.

The number of drivers between the ages of 20-29 years who were involved in March accidents greatly outnumbered the other age groups and represents 32.72 per cent of the total stated ages.

CAUSE OF ACCIDENTS

The principal causes of accidents among the drivers were "violation of right of way," followed closely by "speeding." The third most recurrent cause was "drove off roadway." One hundred fourteen "hit and run" drivers were reported in March, seven of whom were involved in fatal accidents.

INTERSECTION DANGERS

Most pedestrian accidents occurred at intersections, with the second greatest number between intersections. This clearly indicates the necessity of crossing streets only at designated crosswalks and in accordance with traffic regulations at such crosswalks. March pedestrian accidents, though representing only 28.63 per cent of the total accidents caused 39.79 per cent of the total March deaths. Since most pedestrian accidents occur within incorporated cities (only 9.07 per cent of the March pedestrian accidents occurred outside of incorporated cities) they are an important factor that greatly affect the ratio of persons killed per fatal accident in cities.

PEAK HOUR OF ACCIDENTS

The peak hour of accidents moved from 6.01-7 p.m. in February to 5.01-6 p.m. in March. Sundays led the days of the week having the most accidents with a total of 601.

THE WEATHER FACTOR

The longer daylight hours were reflected in the March summary of accidents, when 1587 (56.51%) of the total accidents were reported as having occurred in daylight. Comparatively few accidents were reported under inclement weather conditions; out of the 2808 accidents nineteen were reported as having occurred in "fog or mist," seventy-five in "rain," two in "snow" and one in "smoke or dust."

CARS NOT AT FAULT

More passenger cars were involved in March accidents than any other single type of vehicle. Trucks were second and motorcycles third. Only 152 of the 4298 vehicles involved were definitely reported to be defective mechanically.

INCREASE OVER 1930

An analysis of the accident statistics for the first three months of 1931 disclosed that the total accidents increased 880 or 12.25 per cent over the corresponding period of 1930. According to information received from the State Board of Equalization the consumption of gasoline in California as a motor vehicle fuel increased 14.03 per cent during this period. Motor vehicle deaths during the first quarter of 1931 totaled 566. This total (566) represents an increase of 8.42 per cent over the same period of 1930.

A further analysis determined that 6501 or 80.68 per cent of the 8058 accidents reported during the first three months of 1931 occurred within the limits of the various incorporated cities and were the cause of 77.31 per cent of the total persons injured and 59.54 per cent of the total persons killed.

MONTHLY SUMMARY OF MOTOR VEHICLE ACCIDENTS IN STATE

	March, 1931 Total number reported		This year's total to date	Last year's total to date
	During March, 1931	During March, 1930		
Accidents -----	2,808	2,463	8,958	7,178
Persons killed -----	196	170	566	522
Persons injured -----	3,781	3,253	10,717	9,351
Drivers involved -----	4,254	3,712	12,051	10,693
Pedestrians involved -----	846	854	2,599	2,538
Vehicles involved -----	4,298	3,734	12,175	10,770

Highway Patrol Courtesy Letters

First Aid to Injured

From John F. Williams, Prescott, Arizona: It is with profound satisfaction and a deep sense of gratitude that I write to you regarding the conduct, efficiency, hospitality and untold ability of one of your officers in the Highway Patrol in the State of California. I refer to Officer J. O. Linthicum, or No. 364, stationed at Indio or thereabouts.

Approximately three weeks ago I, in company with two friends, Mr. and Mrs. Tipton, were forced off the road in the deep sand about ten miles from Indio. The car overturned twice and we all were somewhat painfully cut and bruised.

Officer Linthicum, by his promptness in getting us clear of the wreck and rushing us to the hospital for first aid, in all probability saved us many painful hours, and in my case in particular, saved me the loss of my left leg. I had a very severe cut which my physician tells me would have had very serious results, had I not received the prompt medical attention that I received.

In addition to the said officer's efficiency in line of duty, he also invited us to the hospitality of his own home, and allowed us to make ourselves presentable in order to continue our trip.

In closing I will say that in traveling clear across the country from Boston, Massachusetts, to Los Angeles, I have yet to meet with such whole-hearted efficiency and kindness towards strangers as manifested by one of your officers in the patrol.

I, in company with my friends, do sincerely appreciate the same and hope that all good fortune will follow in the footsteps of one of God's own gentlemen, Mr. J. O. Linthicum, No. 364.

Courtesy Commended

From E. P. Malherbe, U. S. N. Retired, Naval Hospital, San Diego: While making a trip from San Diego to Los Angeles, on Saturday, April 18, 1931, the car in which I was a passenger was stopped by Patrolman William Jensen, badge No. 396, for some infraction of the highway laws of the State.

Being blind, I do not know just what section was involved, but while I have lost my sight I still retain the sense of hearing and the conversation I heard between the officer and the driver of the car was a revelation to me, the more so as I have had some experience in stopping and searching cars myself, as a member of what some paper nicknamed "The Night Hawks," in 1927 and 1928, when the Collector of Customs had fifteen men patrolling the highways around Los Angeles, San Diego and Santa Barbara.

While we had orders to be at all times courteous, I learned, for the first time last Saturday, just what that word means.

Had the officer recognized you and your family as passengers in the car instead of sailors and myself, he could not have been more considerate of the choice of his language or treatment and I can not speak too highly of his conduct. He might be a new man on the force.

Speeder Admits Error

From H. Bedford Jones, Hollywood: Yesterday, April 13th, I was halted by an officer of the State Patrol, a couple of miles north of Carpinteria on the Coast Highway, under the following conditions:

The officer was riding along at about forty. I overhauled him and passed, going about forty-three and held this speed steadily. At times I touched forty-five but did not exceed this mark, as the officer was hanging along behind. Upon passing him I called the attention of my wife and son to the speed. Aware that the officer was gradually coming up, they kept track of the speed; when he halted me, he stated that I had been doing fifty-six for the past mile or two.

Either my speedometer must be away off, or else he had been irritated because I had passed him. The latter seemed the most logical, because the three of us could swear that the speed had never exceeded forty-five. He gave me no citation, but entered up the matter on a white ticket.

Today I have had the speedometer checked and found it to be broken.

I am sending in this report to you as an interesting example of how easily a grave injustice might have been done an officer. Apparently he was dead wrong in the matter, and a hot-headed complaint with three witnesses against him might easily have been made. As a matter of fact, I feel that his action has possibly saved me from more serious, if unintentional, speeding charges; and it serves to confirm the very friendly feeling which I believe every good motorist entertains toward your highway force.

I don't know whether you pay any attention to these communications, but I should like to commend this officer for the courtesy he displayed, when he must have felt that my family were all combined to swear falsely against him. That is about the sweetest test of a man's restraint and courtesy; and his were perfect. His number was 371 or 374—I'm not certain. It will show on his report, no doubt.

Gave Tow to Stalled Car

From D. N. Zann, Glendale: It is with pleasure that I write you regarding the following incident, which took place on the State Highway between Ventura and Santa Barbara, California.

On the eve of April 15th, about 11 p.m. we were en route to Santa Barbara from Los Angeles. Just five miles north of Ventura, my car stopped—out of gasoline. Probably you know that service stations on the particular stretch of highway are few and far between. We had been there but a very short while when one of your white patrol cars came along, offering assistance. We stated our plight and rather than leave us sitting on a narrow shoulder of the dark highway, Officers 310 and 311, insisted on towing us to the nearest station, which, incidentally was just six miles further north.

Such courtesy and protection on the part of our California Highway Patrol is certainly a real asset to the motoring public.

Report of Activities

in the

Division of Water Resources

AS OF MARCH 1, 1931

EDWARD HYATT, Chief of Division

Irrigation District
Activities

Applications for
Approval of
Dams

Flood Control and
Reclamation

Bulletins Issued on
Water Resources
Study

IRRIGATION, WATER STORAGE DISTRICTS

A resolution of sufficiency on petition for the organization of an irrigation district to be known as the West Empire Irrigation District was received by the State Engineer from the Board of Supervisors of Kings County, and a report favorable to the calling of an election on organization was made to the Supervisors by the State Engineer. The proposed district contains 7000 acres of land lying along the west side of the lower Kings River in the vicinity of Stratford. The petitioners submit as their principal reason for the formation of the district their desire to control and stabilize whatever water rights they are entitled to and to manage the distribution of the water which the court has allotted to their land through their own system of works. Heretofore whatever water they have obtained from Kings River has been distributed by the Empire Water Company, whose works the district proposes to acquire, and these works are to be obtained by the district without cost through a waiver of certain claims against the water company for damages.

Field visits were made and conferences held with officials of the Buena Vista Water Storage District in Kern County, the Tulare, Terra Bella, Lindsay-Strathmore and Alta Irrigation Districts in Tulare County; the Corcoran, Lemoore, and proposed Empire West Side Irrigation Districts in Kings County; and the Fresno, Consolidated and Tranquillity Irrigation Districts in Fresno County, of the purpose of discussing matters connected with the economic operation of these districts.

Inspection was made of construction work in progress in the El Nido Irrigation District, Merced County, and a field investigation was made on the Oakdale Irrigation District in connection with the proposal of the district to refund certain of its bond issues.

A compilation and preparation of data for the 1930 report on the activities of California irrigation districts have been practically completed and without doubt will be submitted to the State Printer during the early part of May for publication.

The Granada Irrigation District, located in Siskiyou County, is now before the Commission with a plan for the reorganization and refinancing of the district.

At the meeting of the California Bond Certificate Commission held on March 25, favorable action was taken on expenditure orders relating to the following districts:

Carpenter Irrigation District:

Approval of order for expenditures from the construction fund in the amount of \$149,250

Serrano Irrigation District:

Approval of order for expenditures from the construction fund in the amount of \$149,250

El Nido Irrigation District:

Approval of order for expenditures from the construction fund in the amount of \$87,442

Total approved construction fund expenditures \$385,942

DAMS

During April satisfactory progress has been made in reviewing the existing dams throughout the State which are pending approval. Frequent inspections have been made of dams under construction and repair.

To date 755 applications for approval of existing dams are on file; 64 applications for approval of plans and specifications for construction or enlargement, and 142 for approval of plans for repair or alteration.

Application received for approval of plans for repair or alteration:

Eleven such applications have been received during this month.

Applications received for construction or enlargement:

Dam	Owner	County
Chatsworth Highline	City of Los Angeles	Los Angeles
Haypress	Santa Catalina Island Company	Los Angeles
Quaking Asp Gulch No. 1	Antone Avilla	Lassen
Quaking Asp Gulch No. 2	Antone Avilla	Lassen
Donner Creek	Central Pacific Railway	Nevada

An amended application was filed by the City of Pasadena for the approval of plans and specifications for the construction of the Pine Canyon dam 50 feet lower than originally planned. This application is under consideration by the same board of consultants engaged to review the original application and immediately upon a completion of their investigations action on it will be taken by the State Engineer.

Plans approved for construction:

Dam	Owner	County
Benbow	Benbow Power Company	Humboldt

Plans approved for repair or alteration of dams:

Eleven such applications have been approved this month.

Orders have been issued authorizing the use of the following dams:

Dam	Owner	County
Swanzy Lake Dam	Calif. Hawaiian Sugar Refining Co.	Solano
Tiger Creek Reg.	Pacific Gas and Electric Company	Amador

A representative from this office, Mr. E. W. Case, has returned to Modoc and Lassen Counties where he

will remain during the coming summer. He will supervise the repairs and alterations of the many dams in that locality with a view to recommending their approval before the end of the season. Spillway studies have been completed on all these dams, and he is in a position to inform the owners of the State's requirements in this respect. Those wishing to discuss problems relating to their dams may get in touch with him at either Alturas or Susanville.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento and San Joaquin Drainage District: The maintenance force in Sutter County has been engaged principally in routine maintenance of the by-pass structures, levees, drainage canals and pumping plants. Repairs to the Franklin road bridge in the Sutter by-pass have been completed, and repairs have been made on a number of the smaller bridges over the drainage canals. A small crew has been engaged in cutting young thistles on the East Sutter by-pass levee, on which the thistles have been practically eliminated by the work of the past two years.

Flood control project maintenance—bank protection: No bank protection work is now under way as all the jobs for the current season have been completed. The river floating equipment is being repaired and painted by the caretakers under the direction of the river foreman. The launch "Alioth" has been repaired and a new engine installed.

Emergency flood control and rectification of rivers: Channel rectification work at the mouth of Little River in Humboldt County has proceeded and will be completed within a short time. This is being done by the Hammond and Little River Redwood Company in cooperation with the State and Humboldt County. The channel rectification work on the San Jacinto River in cooperation with landowners and the County of Riverside has been completed. This consists of a small levee 2200 feet in length, protected with a wire fence barrier.

Russian River jetty: A crew of eleven men has been employed in the operation of the quarry and railroad, placing rock in the structure. An experimental timber barrier 90 feet in length has been erected in an attempt to prevent the sand of the bar passing over the jetty and into the river channel.

Flood measurements and gages: All gages maintained by this Division are now in operation but will be discontinued on May 1. In the office the compilation of records for the flood seasons of recent years has been continued, for the purpose of incorporating in a report all the data that has not been hitherto published.

WATER RIGHTS

Applications to appropriate:

During the month of March there were received twenty-six applications to appropriate, eleven were canceled and ten were approved. Ten permits were revoked and forty-six licenses were issued.

Field work in connection with the inspection of permits was initiated for the season on March 30. The first trip involving inspection of thirty-one projects scattered throughout Inyo, San Bernardino, Riverside, Los Angeles, Orange and San Diego Counties was completed April 23.

The Division is already beginning to experience

the customary pressure of dry seasons in the way of requests for information with respect to water rights and for assistance in the settlement of controversies between rival claimants. There is at all times a demand upon the Division for assistance along these lines and this becomes accentuated during years of low stream flow.

Adjudications.

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Case pending in the Superior Court of Shasta County, awaiting the Court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in Superior Court of Shasta County awaiting the Court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). At a conference held at Santa Maria on April 21, 1931, a stipulation for consent judgment was signed by all of the parties involved, with the exception of one.

Davis Creek (Modoc County). A tentative decree has been prepared for circulation among counsel prior to submission to court.

Mill Creek (Modoc County). Eighty per cent of the water users have signed the stipulation for consent judgment which was presented at the conference held at Lake City on March 17, 1931. The stipulation is now being circulated among the nonresident parties.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted at the conference held at Cedarville on March 16, 1931.

Franklin Creek (Modoc County). Administration of the schedule of allotments for trial distribution during the 1931 irrigation season was continued throughout the month.

New Pine Creek (Modoc County). Field work on the investigation of the water supply and use of water on New Pine Creek was continued throughout the month.

Water distribution:

Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl and Soldier Creeks (Modoc County). Water master service on these streams was continued throughout the month.

Pit River (Modoc and Lassen Counties). Supervision of diversions from Pit River in Big Valley was continued throughout the month.

Supervision of diversions from Pit River in Hot Springs Valley was begun on April 11, 1931.

CCOPERATIVE SNOW SURVEYS

The main snow surveys for the season covering some one hundred sixty snow courses throughout the Sierra were completed during the last of March and first part of April, and the April 1st bulletin of snow survey and precipitation data and seasonal forecast was placed in the mail early in April.

A general summarization of all data shows:

The water content of the snow on April 1 of this year in per cent of the water content on April 1, 1930, varying from about 30 per cent for certain Owens Valley courses to about 70 per cent at courses in Merced basin with a general average throughout the Sierra of about 55 per cent.

For those few areas where snow surveys have been made for a sufficient number of years to permit the development of "normals," a water content of the snow in per cent of normal to April 1 almost as low as 10 per cent for one or two Owens Valley courses, nearly up to 50 per cent for Yuba basin courses and a general average of about 40 per cent.

The average precipitation to April 1 in per cent of normal to April 1 varying throughout the Sierra from 42 per cent for one station in Owens Valley to about 75 per cent for stations in Stanislaus basin with a general average of about 60 per cent, and an average for Los Angeles, San Gabriel and Santa Ana basins of 60 to 65 per cent.

The estimated 1931 seasonal stream flow in per cent of the 40-year mean (1889-1929) varying from 25 per cent for the Kings basin to 40 per cent for the Tuolumne basin with a combined figure of 33 per cent for the entire Sacramento and San Joaquin basins.

The data and estimates indicate for the Great Central Valley a water supply only better than the record low of 1924 by a small margin. It is to be anticipated, therefore, barring storms of most unusual magnitude and duration within the next few weeks, that conditions of minimum stream flow with resulting salinity encroachment in the case of the Sacramento-San Joaquin Delta, may approach those of 1924.

The bulletin presents the snow survey and precipitation data in detail as well as the forecast of seasonal run-off for each major stream basin. A tabulation is also included showing the water in storage on April 1 in some of the principal reservoirs.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

During the past month most of the work in compiling the data for the 1930 report was completed and the regular field work for the 1931 season was started. The gages for recording stream flow and return flow throughout the Sacramento-San Joaquin territory have been installed and the engineers have made an inspection of all pumping diversions to insure that the proper diversion records are maintained. All new installations have been noted. The inspection shows that practically all of the pumping plants on the river are already in operation due to the extreme dryness of the season. It is apparent that practically no spring run-off of any proportions may be expected and with a continuation of the present heavy draft on the river, low flows may be expected very early in the season.

The salinity sampling has continued at thirty stations and tide gages have been maintained at eight points between Collinsville and Sacramento. The following are comparative salinity and stream flow data for 1930 and 1931. Corresponding stream flow data are also shown for 1924.

Station	Salinity in parts of chlorine per 100,000	
	4/1/31	4/14/30
Bullhead point	630	235
O. and A. ferry	*45	*5
Collinsville	16	4
Antloch	16	5
Jersey	4	5
Emmaton	1	2
Webb pump	*4	*5

Discharge measurements in second-feet

Station	1931	1930	1924
Sacramento River at Red Bluff	4/12 4390	4/12 7160	4/12 4010
Sacramento River at Verona	4/20 4660	4/20 27600	-----
Sacramento River at Sacramento	4/20 6400	4/20 33400	4/20 7300
American River at H St. bridge	4/18 2130	4/18 6000	-----
San Joaquin River near Vernalis	4/2 670	4/2 2940	4/2 1370

Within the last month there have been held at Sacramento two meetings of the Permanent Committee of the Sacramento-San Joaquin River Problems Conference to receive the reports of the State Engineer relative to the water supply to be anticipated and to consider steps to meet the situation. As a result of the meetings, two letters have been sent from the committee to the water users warning of the water situation and recommending as the best conservation measure for the present, the reduction or elimination of crop plantings which will require large amounts of water in July and August. Following the first meeting of the committee a similar letter was also sent to the water users by Major J. R. D. Matheson, District Engineer, Corps of Engineers, United States Army, calling for conservation in the interest of navigation maintenance. Likewise a letter was sent from the Division of Water Resources to the junior water right permittees calling attention to the position which they occupy with respect to water appropriations and warning of the possible necessity of a regulation or suspension of diversions under the later permits in the inverse order of priority. The Division through the Water Supervisor's office is cooperating closely with the water users as represented by the Permanent Committee of the Sacramento-San Joaquin River Problems Conference and is prepared to take whatever steps may be agreed upon to effect maximum conservation and best avoid conflict. The possibility of a temporary schedule of diversions has been considered.

WATER RESOURCES

Pit River investigation (Modoc and Lassen Counties). Routine field work was continued throughout the present month.

Napa Valley investigation: Two new gaging stations have been established for the purpose of determining accretions on Dry Creek and Rector Creek, and miscellaneous measurements of flow have been made on Napa River, Conn Creek, Dry Creek and Rector Creek. Progress has been made in connection with a census of irrigated lands diverting from Napa River and Conn Creek below the upper gaging stations, and all wells which are under observation have been read.

Santa Clara Investigation: Streams have continued low without any possibility of obtaining additional data as to percolation.

South Coastal Basin investigation: This work has gone ahead in a routine way during the past month. A special investigation was made of the feasibility of determination of the possibility of salt water intrusion from the ocean into the pumping area of the Coastal Plain and effort is now being made by Orange County and the City of Long Beach to get together on a program for such work which requires extensive drilling of small wells.

Mojave River investigation: This work has continued in a routine way during the month.

Ventura County investigation: An investigation was made of the reservoir sites on Pirn Creek in connection with conflict between the Division of High-

ways and Santa Clara Valley Protective Association. The relocated ridge route will pass through two reservoir sites on Piru creek which the conservation association has regarded as necessary for conservation of the waters of that stream. A geological examination of the various dam sites and surveys of additional reservoirs have been made. The report is not yet completed.

Water resources reports: Progress has been made in completing the reports on the water resources investigation covering the State water plan for the coordination, development, conservation and utilization of the water resources of the State, authorized under the provisions of chapter 832 of the statutes of 1929.

The following publications relating to various phases of the investigation have been completed in printed form and are now available for distribution:

Bulletin 28-A, "Industrial Survey of Upper San Francisco Bay Area."

Bulletin 31, "Santa Ana River Basin."

Bulletin 32, "South Coastal Basin."

Bulletin 34, "Permissible Annual Charges for Irrigation Water in Upper San Joaquin Valley."

Bulletin 35, "Permissible Economic Rate of Irrigation Development in California."

The following bulletins are now in the hands of the State Printer and it is anticipated that they will be completed in printed form and ready for distribution within the next three or four weeks.

Bulletin 25, "Report to the Legislature of 1931 on State Water Plan."

Bulletin 33, "Rainfall Penetration and Consumptive Use of Water in Santa Ana River Valley and Coastal Plain."

Bulletin 36, "Cost of Irrigation Water in California."

The following bulletins are nearing completion and it is expected that the finished plates and text for these publications can be transmitted to the State Printer during the early part of May for publication.

Bulletin 26, "Sacramento River Basin."

Bulletin 27, "Salinity Control in Sacramento-San Joaquin Delta and Upper San Francisco Bay."

Bulletin 28, "Economic Aspects of a Salt Water Barrier Below Confluence with Sacramento and San Joaquin Rivers."

Bulletin 29, "San Joaquin River Basin."

Progress Report STATE HIGHWAY As of May 1, 1931

C. H. PURCELL, Chief.

Progress of employment Program:

Projects now under contract	101
Estimated number of men employed by construction	2217
Men employed by Division of Highways on maintenance, day labor work and contracts	4169
Total number of men employed	6386

By April 27 projects totaling \$8,013,735 were either under contract, pending award or advertised for bids, which were originally scheduled for advertisement during the coming summer.

Report for April:

Contracts awarded and pending	\$2,965,300
Projects	1,982,800

Work anticipated to be advertised during May ----- 4,685,800

Total ----- \$9,633,900

The types of construction and mileage of each type included in the above tabulation are given in the following summary:

Type	Mileage
Portland cement concrete pavement	17 9
Asphalt concrete pavement	17 6
Bituminous-treated crushed rock surfacing	103 1
Untreated crushed rock surfacing	6 5
Graded roadbed	14 8
Oiling to alleviate dust	654 6
Bridges	12
Total	814 5

Progress Report MOTOR VEHICLES DIVISION

As of May 1, 1931

FRANK G. SNOOK, Chief

Registration statistics:

Fees collected during first quarter of 1931	\$8,151,165
Total paid registrations of motor vehicles for same period	1,906,543
Total exempt registration of motor vehicles for period	35,944
Applicants of nonresident motorists for nonresident permits for period	14,759
Applicants of nonresident motorists for California registrations	35,916

California Highway Patrol report:

Enforcement activities on vehicle lights is increasing.

Monthly report of light activities show 9721 stops made, and 4513 arrests.

Brake activities during March show brakes found defective to have been 7.92 per cent of those tested.

Progress Report DIVISION OF ARCHITECTURE As of May 1, 1931

GEORGE B. McDOUGALL, State Architect, Chief

Projects in Field.

The Division of Architecture now has under actual construction in the field approximately 50 major projects representing a total valuation of \$4,451,475. This construction valuation will provide employment for 1597 persons over a period of ten months.

Contracts awarded in April	\$181,170
Bids received; contracts pending	205,247
Projects out for bids	121,000
Contracts for supplementary work awarded in April	121,803

Total ----- \$629,320

Major projects handled on basis of day labor for which drawings have been completed ----- \$371,000
Projects for which drawings have been completed for California National Guard ----- 75,738

Total ----- \$446,738

Record of Pavement

(For Descriptive

PORTLAND CEMENT

District	County	Route	Section	Location	Miles	Contract	Contractor
I	Humboldt	1	E, G	At Scotia and between Fortuna and Locta	4.3	21TC8	J. V. Galbraith
I	Humboldt	1	G	Eureka-1/2 mile South	0.6	21EC6	Engelhart Paving Co.
III	Glenn	7	A	Logandale-Willows	5.2	23EC1	Basich Bros. Const. Co.
III	Placer	3	A	Through Lincoln	1.7	23TC6	N. M. Ball
III	Yolo	3	A	At Mullen	0.2	23DN2	C. W. Wood
III	Yuba	3	A	Through Wheatland	0.9	23TC3	C. W. Wood
IV	Alameda	5	C	Hayward-Niles	8.7	24EC2	Hanrahan Co.
IV	Marin	1	A	Gallinas Creek-San Rafael	0.8	24EC5	Granfield, Farrar & Carlin
IV	San Mateo	68	A	Through S. San Francisco	0.9	24TC4	Basich Bros. Const. Co.
IV	San Mateo	68	B	S. San Francisco-Burlingame	5.0	24TC2	Basich Bros. Const. Co.
IV	Santa Clara	2	A	San Francisco Creek-San Antonio Ave.	2.1	24EC6	Hanrahan Co.
IV	Santa Clara	2	A	San Antonio Ave.-Sunnyvale	2.8	24EC8	Hanrahan Co.
IV	Sonoma-Marina	1	C, A	Petaluma-Ignacio	7.4	24EC4	Hanrahan Co.
V	Monterey	2	G, H	Near San Ardo	1.5	25EC2	Fredrickson & Watson Co.
V	San Luis Obispo	2	F	Santa Maria River-Los Berros Creek	7.2	25TC1	J. F. Knapp
V	Santa Barbara	2	C	Zaca-Wigmore	4.0	25C82	Cornwall Construction Co.
V	Santa Barbara	2	A	1/2 mile N. of Santa Maria	0.6	25VC1	Cornwall Construction Co.
VII	Los Angeles	2	C	At Liberty Grade	1.2	27FC7	W. F. Peck Co.
VII	Los Angeles	4	E	Newhall Tunnel-Newhall	1.1	27VC3	McCray Co.
VII	Los Angeles	4	F	Tunnel Station-Santa Clara R.	8.5	27VC4	Jahn & Bressi
VII	Orange	60	A	Seal Beach-Sunset Beach	3.3	27FC13	T. M. Morgan Co.
VII	Orange	60	A	Sunset Beach-Newport Beach	5.9	27FC5	Maceo Construction Co.
VII	Orange	60	C	Between Dana Point and Serra	0.9	27FC1	Matich Bros.
VII	San Diego	2	D	San Clemente-San Onofre	0.9	27FC10	Matich Bros.
VII	San Diego	2	E	Balboa Ave.-Torrey Pines Road	5.4	27VC7	Jahn & Bressi
VII	San Diego	12	F	Kitchen Creek-La Posta	3.9	07VC7	Basich Bros. Const. Co.
VIII	Imperial	12	A	Myers Creek Bridge-3 mi. W. of Coyote Wells	2.9	28FC2	Basich Bros. Const. Co.
VIII	Imperial	26	A, H	Brawley-4 miles W. of Westmoreland	10.4	28VC6	A. M. Peck Co.
VIII	Imperial	27	C	El Centro-Holtville	9.0	28VC7	A. M. Peck Co.
VIII	Riverside	19	A	At Wauville	0.5	08VC6	Matich Bros.
X	Solano	7	E	Through Dixon	0.7	210TC4	C. W. Wood
X	Sacramento	4	A	1 mile S. of Arno-Cosumnes River	2.6	210TC8	Fredrickson & Watson Co.
X	San Joaquin	4	C	Cherokee Station-Harney Lane	6.9	210TC5	T. M. Morgan Co.
Total					117.3		

ASPHALTIC CON

District	County	Route	Section	Location	Miles	Contract	Contractor
III	Yolo	7	C	Bretona-Duannigan	5.8	23EC3	Jones & King
IV	Alameda	5	C	Hayward-Niles	8.7	24EC2	Hanrahan Co.
IV	Santa Clara	2	A	San Francisco Creek-San Antonio Ave.	2.3	24EC6	Hanrahan Co.
IV	Santa Clara	2	A	San Antonio Ave.-Sunnyvale	2.1	24EC8	Hanrahan Co.
V	San Luis Obispo	2	B	Atascadero-Faso Robles	9.6	25FC1	Steele Finley
V	Fresno	2	B	Through Atascadero	0.4	25F1	M. J. Bevauda
VI	Fresno	4	A, B	Fowler Switch Canal-Fancher Creek	7.6	26EC3	Peninsula Paving Co.
VI	Fresno	4	A, B	Through Fowler	0.9	26TC1	Peninsula Paving Co.
VI	Madera	4	C	Califa-Northerly Boundary	5.6	26EC2	A. Teichert & Son
VI	Tulare	4	A	Southerly Boundary-Fixley	12.2	26FC1	Valley Paving & Const. Co.
VI	Tulare	4	A, B	Fixley-Tipton	8.6	26CS1	California Const. Co.
VII	Los Angeles	9	C	Cheremont, Mt. Ave.-County Line	1.7	27V4	Griffith Co.
VII	Los Angeles	9	H	Citrus Ave.-Glendora	1.0	27VC5	Griffith Co.
VII	Los Angeles	60	C	Pier Ave.-Gould Lane, Hermosa Beach	0.6	27V3	Ed. Johnson & Sons
VII	Los Angeles-Ventura	2	C, A, B	1 mile E. of County Line-Top Conejo Grade	0.2	27FFC2	Griffith Co.
VII	Ventura	2	B	Conejo Creek-Camarillo	2.3	27FC6	Griffith Co.
VIII	Imperial	12	C	Dixieland-Seelye	5.0	28FC1	R. E. Hazard Co.
X	San Joaquin	5	B	South Santa Road-East Santa Road	1.9	210EC2	Healey-Moore Co.
X	San Joaquin	4	D	Forest Lake-Northerly Boundary	1.4	210TC9	Clark & Henry
Total					77.9		

Construction, 1930

Article, see page 22)

CONCRETE PAVEMENT

Resident engineer	Street assistants	Average strength of concrete in 28 days, pounds per square inch.	Average strength of material, pounds per square inch.	Average yardage laid per day, cubic yards.	Average daily variation in cement, in per cent.	Roughometer index of roughness in inches per mile.	Type of equipment used		District
							Mixer	Finisher	
C. P. Sweet	J. A. Hutchinson, C. R. Hagberg	5,464	6,026	292 9	0 89	6 6	Footc	Ord (2)	I
M. H. Hubbs	J. A. Hutchinson, C. R. Hagberg	5,114		195 7	1 12	8 0	Footc	Ord (2)	I
E. J. Peterson	A. C. Briney, W. J. Braker	5,240	5,752	405 5	0 37	5 9	Ransome	Ord (2)	III
J. D. Greene	W. D. Sedgwick	5,503	5,276	208 0	0 84	10 2	Koehring	Ord (2)	III
C. A. Potter	J. Meyer	4,586		47 9	2 15	14 3	Paris Transit		
J. D. Greene	A. C. Briney	5,421	5,458	240 2	1 37	8 8	Mixer	Ord	III
W. A. Rice	R. A. Westbrook	3,952	4,760	274 1	1 00	9 7	Footc	Ord (2)	III
M. C. Fosgate	D. N. Sapp	5,048		213 6	1 55	11 3	Footc	Ord	IV
W. A. Rice	R. A. Westbrook, V. R. Glass	4,392		886 9	1 04	7 3	Ransome (2)	Lakewood, Ord	IV
W. A. Rice	R. A. Westbrook, V. R. Glass	4,391	4,807	776 2	0 88	6 2	Ransome (2)	Lakewood, Ord	IV
C. E. Price	R. A. Westbrook	5,077	7,052	252 5	1 25	11 6	Footc	Ord (2)	IV
C. E. Price	E. Carlstad, E. W. Herbering	4,890		277 0	1 32	9 9	Footc	Ord (2)	IV
E. E. Sorenson	E. Carlstad, E. W. Herbering	5,706	5,957	257 4	1 32	10 5	Footc	Ord (2)	IV
K. B. Grimm	J. S. Peterson, F. E. Bosch	4,161	4,210	222 9	0 32	13 4	Footc	Ord	V
T. W. Voss	E. F. Carter, R. P. Caten	5,355	5,325	313 7	0 64	7 5	Footc	Ord (2)	V
F. R. Baker	E. W. Taylor, F. C. Weigel	5,145	4,776	236 8	0 86	8 9	Koehring	Ord	V
T. W. Voss	N. S. Hamilton, F. C. Weigel	6,192		137 7	0 25	4 8	Footc	Ord	V
W. J. Calvin	W. T. Lamb, H. D. Johnson	4,250		284 0	0 45	4 8	Koehring	Ord	VII
W. I. Templeton	H. B. Lindley	5,075		225 1	0 41	12 3	Koehring	Ord	VII
R. D. Kinsey	W. T. Lamb, H. D. Johnson	5,676	6,019	358 4	0 43	5 9	Koehring	Ord	VII
W. D. Eaton	C. J. McCullough	5,423		325 7	0 69	6 7	Koehring	Lakewood, Ord	VII
W. D. Eaton	C. J. McCullough	5,040		320 8	0 61	7 7	Footc	Lakewood	VII
H. B. Lindley	T. A. Rosherry	4,542		159 3	0 96	10 2	Rex	Lakewood	VII
H. B. Lindley	C. J. McCullough, C. T. Warren	6,218	6,497	258 0	0 28	6 1	Rex	Lakewood	VII
F. A. Read	C. J. McCullough, G. F. Allen	4,840	6,080	427 3	0 44	6 5	Koehring	Ord (2)	VII
J. M. Lackey	C. J. McCullough	4,275	4,826	260 8	0 78	8 6	Rex	Lakewood	VII
B. A. Price	G. E. Malkson, T. C. Yeager	5,668		218 0	0 68	13 6	Rex	Lakewood	VIII
R. C. Payoe	G. E. Malkson	4,043	4,947	354 9	1 12	10 6	Rex	Lakewood, Ord	VIII
J. M. Hollister	G. E. Malkson	4,349	4,980	306 1	0 41	8 4	Rex	Lakewood, Ord	VIII
L. E. Cole	C. C. Harden	4,943		210 6	0 79	16 1	Rex	Lakewood	VIII
J. W. Cole	R. M. Parrish	5,740	5,949	202 6	0 95	8 6	Footc	Ord (2)	X
G. R. Hubbard	J. S. Langenbach	5,221		296 8	0 51	8 9	Footc	Ord (2)	X
G. R. Hubbard	R. M. Parrish	4,606	5,969	342 4	0 78	8 2	Koehring	Ord (2)	X
Average				319 2					

CRETE PAVEMENT

Resident engineer	Street assistant	Average strength of concrete in 28 days, pounds per square inch.	Average strength of material, pounds per square inch.	Average relative specific gravity of surface mix in per cent.	Average stability of surface mix in pounds.	Roughometer index of roughness in inches per mile		Type of equipment used		District
						Hand finish	Machine finish	Mixing plant	Finisher	
F. R. Baker	C. F. Child, W. J. Braker	603 7	92 9	3,609		9 1		Madseo	Ord	III
W. A. Rice	R. A. Westbrook	417 4	90 5	2,425		14 2		Geiger	Ord	IV
C. E. Price	A. W. Carr	354 8	96 0	2,410		12 8		Geiger	Ord	IV
C. F. Price	E. Carlstad, A. W. Carr	420 0	93 0	2,794		9 5		Geiger	Ord	V
C. T. Schultz	D. Davis, J. C. Adams	375 2	95 8	2,522		11 5		Home-made	Ord	V
C. T. Schultz	E. D. Davis, J. C. Adams	254 2	93 4	2,156		11 5		Home-made	Ord	V
H. B. La Forge	L. J. Low	1040 9	96 8	3,660		7 4		Geiger	Ord (2)	VI
H. B. La Forge	L. J. Low	783 9	96 8	3,660		7 4		Geiger	Ord (2)	VI
E. Evers	C. L. Harkins	479 7	95 3	3,007		10 2		Geiger	Ord (2)	VI
H. B. La Forge	W. B. Skagerson, J. A. Whyte	679 9	93 1	3,087		8 3		Unio Iron Wks.	Ord	VI
W. T. Rhodes	L. J. Low, P. A. Boulton	883 3	91 7	2,997		7 4		Geiger	Ord (2)	VI
J. M. Lackey	L. R. McNeely	594 6	94 8	3,153	25 1	16 5		Totman	Ord	VII
J. M. Lackey	L. R. McNeely	487 0	92 2	4,435		11 4		Totman	Ord	VII
L. R. McNeely	H. S. Barhite	367 0	96 6	2,230	21 2			Madseo	Hand	VII
R. D. Kinsey	H. D. Johnson	235 0		3,950	29 4			Totman	Hand	VII
R. D. Kinsey	H. D. Johnson	352 9		2,797		14 9		Totman	Ord	VII
H. O. Ragun	B. Landers, T. C. Yeager	413 0	94 3	1,970		17 7		Lakewood	Ord	VIII
J. W. Cole	C. M. Hanson	370 6	94 1	3,058		9 7		Geiger	Lakewood	X
A. K. Nulty	C. M. Hanson	445 2	94 7	3,431		11 8		Madseo	Ord	X
Average				582 9						

1930 Construction Record Tabulation

(For Descriptive Article, see page 22)

YEARLY COMPARISONS BY DISTRICTS

District	Miles constructed					Average compressive strength, pounds per square inch, 28-day age					Average roughness, inches per mile					District		
	1925	1926	1927	1928	1929	1930	1925	1926	1927	1928	1929	1930	1925	1926	1927		1928	1929	1930
I	6.6					4.9	4.980				3.553	5.426	11.7				11.3	6.8
II	1.5				8.6		4.065				3.449	5.314	43.0				7.6	II
III	0.6		0.4	1.1	9.6	8.0	3.325		3.310	3.160	4.449	5.314	43.0		5.6		7.4	III
IV	7.7	7.2	10.5	4.6	16.5	27.7	5.110	4.915	4.845	4.980	4.239	4.706	29.5	5.7	8.5		8.4	IV
V	5.0		5.9	10.0	6.6	13.3	4.790		4.790	3.810	3.996	5.200	11.7		5.1		7.5	V
VI	5.0				6.6		4.670		4.410	4.735	3.426	5.168	10.0				7.1	VI
VII	8.6	44.6	37.2	2.0	37.4	30.4	3.995	4.445	4.410	4.735	3.426	5.168	10.0	6.8	8.1		7.0	VII
VIII	12.5	3.0		4.8	14.0	22.8	3.945	3.800	4.410	4.735	3.426	5.168	10.0	15.4			10.2	VIII
IX																		IX
X	9.0	0.5		11.1	3.2	10.2	4.490	3.960	4.485	4.310	4.485	4.310	10.5	6.5		7.5	9.0	X
State	51.5	55.3	54.0	33.6	102.4	117.3	4.311	4.214	4.510	4.235	3.630	4.042	14.3	7.1	7.8		8.2	State

PORTLAND CEMENT CONCRETE PAVEMENT

[illegible]

ASPHALT CONCRETE PAVEMENT

District	Miles constructed										Average roughness, inches per mile										District
	1925	1926	1927		1928		1929		1930		1925	1926	1927		1928		1929		1930		
			Hand	Machine	Hand	Machine	Hand	Machine	Hand	Machine			Hand	Machine	Hand	Machine	Hand	Machine			
I	1.8	1.1	3.1		0.7	1.2			5.8	90.6	31.4	25.0			34.3	90.3		9.1			
II	1.9	0.7	2.5		0.7	3.4		3.8	24.6	62.6	35.9	35.9			31.3	18.7		13.2			
III	1.6	7.3						13.7	27.2	24.2	29.2				21.6	20.9		8.0			
IV	8.4	4.5	10.1	12.2	0.7	12.6	6.1	16.3	33.9	18.9	19.2	19.9	14.6		21.6	10.7	23.4	11.5			
V			1.0		2.3	3.5	6.9	0.8	5.0			17.6		34.1	8.6			8.2			
VI			9.0		1.0	16.5	23.9	5.0			23.3	30.8		25.7	17.7			8.2			
VII		21.3																14.2			
VIII																		17.7			
IX																		10.6			
X	2.6	12.8			0.2			3.3		50.4	25.4				29.5						
State	16.3	47.7	25.7	12.2	7.6	37.2	4.0	63.6	0.8	77.1	33.2	24.1	25.2	14.6	30.9	14.7	20.9	13.6	10.6		

BITUMINOUS MACADAM

District	County	Route	Section	Location	Miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
I	Humboldt	1	I	Mill Creek-Trenton	10.7	21TC3	Hedley-Moore Co.	E. A. Wolfe	C. R. Hachberg	27.1	I
I	Humboldt	1	K	mi. S. of Trenton	15.1	21TC5	Hedley-Moore Co.	E. A. Wolfe	J. E. Kinyon	21.6	I
IV	Humboldt	1	C	San Rafael-Alta	1.9	24EC5	Granfield, Farrar & Carlin	M. C. Fosgate	D. N. Sapp	33.5	IV
IV	Marin	1	C	San Rafael-Alta	4.4	24EC7	Granfield, Farrar & Carlin	M. C. Fosgate	D. N. Sapp	21.4	IV
IV	Marin	52	A	Belvedere-Crossing-Timuron	1.3	24WC3	Granfield, Farrar & Carlin	M. C. Fosgate	W. Thomas	26.2	IV
IV	Marin	1	C, A	Petaluma-Ignacio	4.5	24EC4	Harriman Co.	C. E. Sorenson	J. A. Whitely	26.8	IV
VI	Sonoma-Marin	33	A	Westerly Boundary-Junction Pumping Station	15.5	69NC3	Falley Paving Co.	C. G. Kolster	B. M. Cooley	44.6	VI
VI	Kern	33	C	5 miles-7 mi. S. E. of Lost Hills	15.5	69NC5	H. C. C. Co.	C. G. Kolster	T. A. Roseberry and L. F. Phillips	44.6	VI
VII	Los Angeles	4	B	1.3 miles to 13.9 miles N. of Castaic School	12.6	27FC11	Southwest Paving Co.	R. D. Kinsey		27.0	VII
				Total	88.6						

ARMOR COAT

III	Nevada	15	C	Nevada City-1 mile W. of Washington Road	11.7	69CN1	C. R. Adams	J. Upham	C. F. Child	63.0	III
IX	Mono	23	G-H	Mainly Ranch-Leavine	2.0	69FC3 { 29WC3	C. Milne	V. E. Pearson	P. E. Evans	59.3	IX
				Total	13.7						

1930 Construction Record Tabulation—Continued

PLANT OIL MIX

District	County	Route	Section	Location	Miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
VI	Kern.....	57	B, C	7 miles E. of Portland Jet, San Emigilio Road	12.2	26XC1	Los Angeles Decomposed Granite Co.	J. N. Birwell	H. Hawkins	10 2	VI
VI	Kern.....	57	C	San Emigilio Road-Route 4	9 7	26XC3	V. R. Dennis Co.	C. F. Marshall	W. L. Lovering	36 9	VI
VI	Kern.....	57	F, G	1½ miles E. of Cottonwood Creek-Democrat Springs	13 0	26XC4	A. Tishert & Son	W. T. Rhodes	P. B. Boulton	33 3	VI
VIII	San Bernardino.....	31	G, H	2 miles E. of Yermo	13 0	26XC4	G. W. H. Smith	O. B. Burdick	L. H. Bailey	12 6	VIII
VIII	San Bernardino.....	58	H, J	2 miles W. of Arroyo-1½ miles W. of Sileria	19 5	26XC4	New Mexico Const. Co.	J. M. Hodges	W. Ford	9 3	VIII
VIII	San Bernardino.....	58	J, K	1½ miles W. of Arroyo-6 miles E. of Aubrey	22 4	26XC5	New Mexico Const. Co.	B. M. Gallagher	W. F. Kaill	20 0	IX
IX	Inyo.....	23	G	Little Lake-Coon Jet	3 7	26XC1	F. W. Nighliert	B. M. Gallagher	W. F. Kaill	22 7	IX
IX	Inyo.....	23	G	Southerly Boundary-Little Lake	9 8	26XC2	Allied Contractors, Inc.	S. C. Risley	R. H. Ostrander	15 1	IX
IX	Inyo.....	23	H, J	Coon Jet-Olandia	21 3	26XC4	Allied Contractors, Inc.	S. C. Risley	W. F. Kaill	17 8	IX
IX	Kern.....	23	C, D	2 miles S. of Ricardo	10 2	26XC5	G. W. Ellis	V. E. Pearson	R. Ostrander	17 3	IX
IX	Kern.....	23	D	7 miles N. of Ricardo	10 2	26XC5	G. W. Ellis	V. E. Pearson	R. Ostrander	17 3	IX
IX	Kern.....	23	E	Freeman-Northerly Boundary	13 8	26XC1	Bardet & Matthews and Black & Hagg	V. E. Pearson	D. J. Bouch	15 0	IX
Total					164 5						

ROAD OIL MIX

District	County	Route	Section	Location	Miles	Contract	Contractor	Resident Engineer	Street Assistant	Roughometer index of roughness, inches per mile	District
I	Del Norte.....	1	A	Southerly Boundary-Wilson Creek	12 7	21TC10	Hornstreet & Bell	E. A. Wolfe	Paul Steegstrup	20 6	I
X	San Joaquin.....	5	B	French Camp-Stockton	1 8	210TC7	Larsen Bros.	A. L. Tschantz, Mahn.	L. E. Ford	37 6	X
Total					14 5						

HIGHWAY BIDS AND AWARDS

For the Month of April

ALAMEDA COUNTY—Between Stanton Ave. and Foothill Blvd. About 0.6 mile to be graded and paved with Portland cement concrete. Dist. IV, Rt. 5, Section B. M. J. Bevanda, Stockton, \$39,147; contract awarded to Jones & King, Hayward, \$34,595.

AMADOR COUNTY—Treating with light and heavy fuel oil between Chapman's and Silver Lake. Thirty-four and three-tenths miles. Dist. X, Rt. 34, Section E, F, G and H. Pacific Tank Lines, Inc., Los Angeles, \$10,024; C. W. Wood, Stockton, \$9,648; Edw. A. Peres, Richmond, \$10,367; contract awarded to Basalt Rock Co., Inc., Napa, \$7,881.25.

BUTTE AND PLUMAS COUNTIES—Treating with light fuel oil, portions between Miners Ranch and Quiney, 47.8 miles. Dist. III, Rt. 21, Section A, B and C. Pacific Tank Lines, Inc., Los Angeles, \$9,888; Clyde W. Wood, Stockton, \$7,840; Basalt Rock Co., Inc., Napa, \$8,640; contract awarded to D. McDonald, Sacramento, \$7,636.

HUMBOLDT COUNTY—Between Loleta and one-half mile south of Eureka. Five and three-tenths miles to be surfaced with bituminous treated gravel or stone and 4.7 miles to be widened with bituminous treated crushed gravel or stone borders. Mercer Fraser Co., Eureka, \$71,197; Heafey Moore Co., Oakland, \$62,770; Smith Bros. Co., Eureka, \$69,762; contract awarded to Hemstreet & Bell, Marysville, \$62,685.

IMPERIAL COUNTY—In Imperial County through the S. D. & A. R. R. Co. Undergrade crossing about 0.2 mile in length, graded and paved with Portland cement concrete. Dist. VIII, Rt. 12, Section A. Martin Green, San Bernardino, \$9,469; Charles E. Farrell, El Centro, \$7,833; R. E. Hazard Contracting Co., San Diego, \$8,864; contract awarded to Matich Bros., Elsinore, \$7,520.

KERN COUNTY—Furnishing and applying heavy fuel oil as a dust palliative on 31.2 miles of State highway between Mojave and the San Bernardino County line. Dist. IX, Rt. 58, Section A and B. U. B. Lee, San Leandro, \$6,334; Fred W. Nighbert, Bakersfield, \$6,220; Pacific Tank Lines, Inc., Los Angeles, \$5,872; Basalt Rock Co., Inc., Gilmore Oil Co., Ltd., Los Angeles, \$6,960; California Road Oil Service Co., Ltd., Wilmington, \$7,786; L. C. Pulley, Long Beach, \$7,264; contract awarded to Square Oil Company, Inc., Los Angeles, \$5,220.

LAKE COUNTY—Applying light fuel oil as dust palliative on 10.9 miles. Dist. III, Rt. 15, Section B. D. McDonald, Sacramento, \$1,584; Basalt Rock Co., Inc., Napa, \$1,686; contract awarded to Chas. Kuppinger, Lakeport, \$1,314.

LOS ANGELES COUNTY—Between 4 miles north of La Canada and Colby Canyon. About 5 miles to be graded. Dist. VII, Rt. 61, Section A. Vonden Heller & Pierson, Castaic, \$195,959; M. S. Ross, Los Angeles, \$424,217; O. A. Lindberg, Stockton, \$497,640; George Pollock Co., Sacramento, \$465,684; H. W. Rohl Co., Los Angeles, \$415,372; Macco Construction Co., Clearwater, \$421,258; C. G. Willis & Sons, Los Angeles, \$486,649; Merritt Chapman & Scott Corp., San Pedro, \$597,276; contract awarded to T. M. Morgan Paving Co., Los Angeles, \$399,220.

LOS ANGELES COUNTY—Between Baileys Ranch and Neenach School. About 7.5 miles to be graded and oiled. Dist. VII, Rt. 59, Section A. C. G. Willis & Sons, Los Angeles, \$71,970; Steele

Finley, Santa Ana, \$50,254; Dan G. Munro, Los Angeles, \$62,617; McCray Co., Los Angeles, \$67,125; Frank W. Hammer, Los Angeles, \$60,032; Macco Const. Co., Clearwater, \$55,425; Hartman Const. Co., Bakersfield, \$61,940; Chas. A. Ladavege, South Gate, \$61,262; P. J. Akmadzich, Los Angeles, \$60,405; Owl Truck Co., Inc., Compton, \$55,967; Dimmitt & Taylor, Los Angeles, \$52,322; Fred W. Nighbert, Bakersfield, \$59,655; J. G. Donovan & Son, Los Angeles, \$69,785; contract awarded to Gibbons & Reed Co., Burbank, \$48,749.

LOS ANGELES COUNTY—Between Canton Creek and Piru Creek. About 7.3 miles to be graded. Dist. VII, Rt. 4, Section H and I. Fredrickson & Watson Const. Co. and Fredrickson Bros., Oakland, \$551,007; Gibbons & Reed Co., Burbank, \$678,510; Granfield, Farrar & Carlin, San Francisco, \$505,682; Vonder Hellen & Pierson, Castaic, \$534,262; H. W. Rohl Company, Los Angeles, \$530,659; George Pollock Co., Sacramento, \$539,456; contract awarded to Will F. Peck Co., Los Angeles, \$422,221.

MADERA COUNTY—At Berenda Slough. A concrete girder bridge consisting of eighteen 20-foot 6-inch spans on concrete pile bents. Dist. VI, Rt. 4, Section C. A. W. Kitchen, San Francisco, \$33,575; Mead Const. Co., Wilmington, \$36,847; Liner & Allen, Merced, \$32,515; Fredrickson & Watson Const. Co. and Fredrickson Bros., Oakland, \$36,262; Robinson-Roberts Co., Los Angeles, \$41,905; L. C. Clark and C. E. Doughty, Visalia, \$34,507; Oberg Bros., Los Angeles, \$37,582; Geo. J. Olrich Const. Co., Modesto, \$32,435; Neves & Harp, Santa Clara, \$32,114; contract awarded to Thermofite Const. Inc., San Jose, \$30,734.

MENDOCINO COUNTY—Furnish and apply light fuel oil as dust palliative between McDonald and Flynn Creek. Dist. IV, Rt. 48, Section A, B and C. Basalt Rock Co., Inc., Napa, \$8,400; Peres & Gatto, Richmond, \$9,640; Edw. M. Dearborn, Redwood City, \$10,200; Jack Casson, Hayward, \$8,640; C. W. Wood, Stockton, \$9,000; contract awarded to C. F. Fredrickson & Sons, Lower Lake, \$8,400.

MERCED COUNTY—About 2½ miles east of Merced. Overhead crossing consisting of thirty-one 40-foot spans and seven 20-foot spans with Portland concrete cement. Deck on steel-pile bents. Dist. VI, Rt. 18, Section A. J. F. Knapp, Oakland, \$108,825; Barrett & Hilt, San Francisco, \$112,684; Guy F. Atkinson Company, San Francisco, \$112,905; Mercer-Fraser Co., Eureka, \$120,280; Bodenhamer Const. Co., Oakland, \$105,481; Oberg Bros., Los Angeles, \$111,820; A. W. Kitchen, San Francisco, \$110,484; Merritt Chapman & Scott Corp., San Pedro, \$109,715; Gutleben Bros., Oakland, \$107,351; Fredrickson & Watson Const. Co. and Fredrickson Bros., Oakland, \$108,452; David G. Johns, Santa Monica, \$110,777; C. W. Wood, Stockton, \$113,383; Lingren & Swinerton, Inc., Sacramento, \$107,298; Ralph McLean & Co., San Francisco, \$113,644; Rocca & Caletti, San Rafael, \$106,789; contract awarded to M. B. McGowan, San Francisco, \$102,400.

MONO COUNTY—Between 2 miles west of Bridgeport and Sonora Junction, about 14.2 miles to be graded. Dist. IX, Rt. 23, Section J. Kennedy-Bayles Construction Co., Biggs, \$165,533; C. Emil Force, Piedmont, \$231,604; Morrison-Kaudens Co., Boise, Idaho, \$193,522; Hemstreet Bell, Marysville, \$183,306; H. W. Rohl, Los Angeles, \$188,149; Gist & Bell, Arcadia, \$197,385; G. W. Ellis, Los Angeles, \$193,837; C. G. Willis & Sons, Los Angeles, \$176,231; MacDonald & Kahn Co., Ltd., \$220,353; Triangle Rock & Gravel Co., San Bernardino, \$192,474; Nevada Construction Co., Fallon, Nevada, \$199,186; contract

awarded to Robinson-Roberts Co., Los Angeles, \$129,631.

PLACER COUNTY—About one-half mile west of Auburn. Constructing six 19-foot timber spans and one 40-foot steel span bridge across the Auburn Ravine. Dist. III, Rt. 17, Section B. J. W. Hoopes, Sacramento, \$11,543; A. Young, Yreka, \$10,898; M. B. McGowan, San Francisco, \$11,754; Clinton-Stephenson Const. Co., Ltd., San Francisco, \$11,436; F. H. Nielson, Orland, \$12,490; Robinson-Roberts Co., Los Angeles, \$11,674; Geo. J. Ulrich Const. Co., Modesto, \$9,791; W. H. Houser, Oakland, \$11,486; contract awarded to Peter F. Bender, North Sacramento, \$9,764.

PLACER AND EL DORADO COUNTIES—Treating with light fuel oil. Between Auburn and Placerville and between El Dorado and Cosumnes River, 31.9 miles. Dist. III, Rt. 65, Section A, B and C. D. McDonald, Sacramento, \$5,080; Carl Mankel, Sacramento, \$6,147; E. F. Hilliard, Sacramento, \$5,698; Pacific Tank Lines, Inc., Los Angeles, \$5,883; Basalt Rock Co., Inc., Napa, \$5,557; Clyde Wood, Stockton, \$4,912; Jack Casson, Hayward, \$4,238.

PLACER COUNTY—Across Conon Creek. Reinforced concrete girder bridge. Six 34-foot 6-inch spans on reinforced concrete pile bents. Dist. III, Rt. 3, Section B. Holdener Const. Co., Sacramento, \$20,006; A. T. Howe, Santa Rosa, \$21,198; Peter F. Bender, North Sacramento, \$21,345; contract awarded to Geo. J. Ulrich, Modesto, \$18,973.

PLUMAS AND LASSEN COUNTIES—Between Chester and Willards. About 25.3 miles to be surfaced with crushed gravel or stone. Dist. II, Rt. 29, Section A and B. Fimmel Co., Inc., Sacramento, \$121,636; C. W. Wood, Stockton, \$119,308; Hemstreet & Bell, Marysville, \$109,821; Fred W. Nighbert, Bakersfield, \$129,781; Tiffany, McReynolds, Tiffany, San Jose, \$114,675; D. McDonald, Sacramento, \$119,171; Granite Const. Co., Watsonville, \$110,717; N. M. Ball, Porterville, \$125,367; contract awarded to Irving L. Ryder, San Jose, \$96,533.

PLUMAS COUNTY—Between Spanish Creek and one mile south of Keddies. About 1.4 miles to be graded. Dist. II, Rt. 21, Section B and C. Nevada Contracting Co., Fallon, Nevada, \$91,987; C. G. Willis & Sons, Inc., Los Angeles, \$143,178; Morrison-Knudson Co., Boise, Idaho, \$84,329; Clarence Young, Oakland, \$87,746; Kennedy-Bayles Const. Co., Biggs, \$126,483; H. H. Boomer, San Francisco, \$89,561; contract awarded to Chigris-Sutcos, San Francisco, \$69,134.

SAN DIEGO COUNTY—Across San Dieguito River—R. C. girder bridge, eleven 54-foot spans on concrete piers and abutments with wing walls on pile foundations. Dist. VII, Rt. 2, Section A. Bodenhamer Const. Co., Oakland, \$140,657; Merritt-Chapman & Scott Corp., San Pedro, \$139,900; R. R. Bishop, Long Beach, \$154,379; Robinson-Roberts Co., Los Angeles, \$166,869; Lynch-Cannon Engineering Co., Los Angeles, \$157,625; Herbert M. Baruch Corp., Ltd., Los Angeles, \$143,725; J. F. Knapp, Oakland, \$139,600; Macco Const. Co., Clearwater, \$147,579; R. H. Travers, Los Angeles, \$157,452; J. S. Metzger & Son, Los Angeles, \$151,810; B. B. Boyd, San Diego, \$173,064; Owl Truck Co., Compton, \$164,844; Oberg Bros., Los Angeles, \$147,632; contract awarded to David G. Johns, Santa Monica, \$138,678.

SAN DIEGO COUNTY—Between La Posta Creek and Campo Road Junction. About 8.8 miles to be paved with Portland cement concrete. Dist. VII, Rt. 12, Section F. Sander Pearson, Santa Monica, \$308,103; Geo. H. Oswald, Los Angeles, \$286,545; Ed Johnson & Sons, Los Angeles, \$298,062; Daley

Corp., San Diego, \$285,755; Griffithy Co., Los Angeles, \$285,627; Central California Roads Co., Southern California Roads Co., Los Angeles, \$269,748; Matich Bros., Elsinore, \$269,962; Basich Bros. Const. Co., Torrance, \$242,273; contract awarded to E. Paul Ford, San Diego, \$240,751.

SAN DIEGO COUNTY—At Bostonia, about 1.5 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 12, Section C. V. R. Dennis Construction Co., San Diego, \$43,669; Griffithy Co., Los Angeles, \$43,694; B. G. Garrot, San Diego, \$44,817; Basich Bros. Const. Co., Torrance, \$45,447; Sander Pearson, Santa Monica, \$48,400; contract awarded to Matich Bros., Elsinore, \$42,505.

SAN MATEO COUNTY—Between Burlingame and San Mateo. About 3 miles to be paved with Portland concrete cement. Dist. IV, Rt. 68, Section B-C. Hanrahan Co., San Francisco, \$217,447; Fredrickson, Watson Construction Co., and Fredrickson Bros., Oakland, \$233,029; C. W. Wood, Stockton, \$241,792; contract awarded to Basich Bros. Const. Co., Torrance, \$212,933.

SAN MATEO COUNTY—Between Rancho San Mateo and Half Moon Bay Road. About 6.6 miles to be surfaced with crushed rock and screenings to be stockpiled. Dist. IV, Rt. 55, Section B. Beerman & White, Belmont, \$33,300; contract awarded to H. E. Casey Co., San Mateo, \$30,225.

SANTA BARBARA COUNTY—Between Wigmere and Los Alamos. About 3.7 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Section C. Macco Const. Co., Clearwater, \$125,235; Cornwall Construction Co., Santa Barbara, \$122,229; W. A. Dantanville, Salinas, \$138,063; contract awarded to Basich Bros. Const. Co., Torrance, \$118,066.

SANTA CLARA COUNTY—Bridge across Carnadero Creek. Four 35-foot spans on concrete bents and 0.35 mile to be graded and paved with Portland cement concrete. Dist. IV, Rt. 2, Section C. Thermolite Const., Inc., San Jose, \$51,121; A. J. Raisch, San Jose, \$51,426; A. W. Kitchen, San Francisco, \$56,008; David G. Johns, Santa Monica, \$62,500; M. B. McGowan, San Francisco, \$53,853; Barrett & Hilt, San Francisco, \$65,755; Fredrickson & Watson Const. Co., and Fredrickson Bros., Oakland, \$54,464; Peter McHugh, San Francisco, \$59,554; Neves & Harp, Santa Clara, \$55,134; contract awarded to Oberg Bros., Los Angeles, \$50,158.

SANTA CRUZ COUNTY—Furnish and apply light fuel oil as dust palliative between California Redwood Park and Waterman Switch. Dist. IV, Rt. 42, Section A. Jack Casson, Hayward, \$3,852; Basalt Rock Co., Inc., Napa, \$4,050; Granite Const. Co., Watsonville, \$4,230; Edw. W. Dearborn, Redwood City, \$3,870; C. W. Wood, Stockton, \$3,330; J. P. Holland, Inc., San Francisco, \$5,400; contract awarded to Edward A. Peres, Richmond, \$3,240.

SANTA CRUZ COUNTY—Between Waterman Switchback and Saratoga Gap. About 6.5 miles in length, three-fifths miles to be graded and surfaced with crusher run base and 6.5 miles to be paved with bituminous macadam. Dist. IV, Rt. 42, Section A. Fredrickson & Watson Const. Co. and Fredrickson Bros., Oakland, \$212,838; O. A. Lindberg, Stockton, \$222,152; Geo. Pollock Co., Sacramento, \$245,860; Granfield, Farrar & Carlin, San Francisco, \$241,733; Frank C. Cuffe, San Rafael, \$259,313; Dan C. Munro, Los Angeles, \$228,200; Robinson-Roberts Co., Los Angeles, \$265,924; Granite Const. Co., Watsonville, \$232,820; contract awarded to Healy-Tibbitts Const. Co., San Francisco, \$207,483.

SIERRA AND LASSEN COUNTIES—Treating with heavy fuel oil between 2 miles west of Milford and Doyle and between Long Valley Creek and the Nevada State line. Forty-two and two-tenths miles. Dist. II, Rt. 29, Section D, E and A. Jack Casson, Hayward, \$10,682; D. McDonald, Sacramento, \$10,682; contract awarded to Basalt Rock Co., Inc., Napa, \$10,029.75.

SISKIYOU COUNTY—Treating with heavy fuel oil. About 21 miles. Between Shasta River and Walker Station. Dist. II, Rt. 46, Section D. Basalt Rock Co., Inc., Napa, \$5,604; contract awarded to D. McDonald, Sacramento, \$5,477.

SONOMA COUNTY—At Lyllon Overhead. About 1.1 miles to be graded and paved with Portland concrete cement. Dist. IV, Rt. 1, Section A. Clark & Henery Construction Co., San Francisco, \$15,239; contract awarded to J. V. Galbraith, Petaluma, \$14,399.

TEHAMA COUNTY—Between Dales Ranch and Paynes Creek. About 7.3 miles to be surfaced with bituminous treated crushed gravel or stone. Dist. II, Rt. 29, Section A. Fred W. Nighbert, Bakersfield, \$60,060; C. W. Wood, Stockton, \$65,035; Granite Const. Co., Ltd., Watsonville, \$77,956; N. M. Ball, Porterville, \$74,884; Fimml Co., Inc., Sacramento, \$64,640; D. McDonald, Sacramento, \$64,724; contract awarded to Hemstreet & Bell, Marysville, \$59,487.

TULARE COUNTY—Between Goshen and Kingsburg. About 12.1 miles to be graded and paved with asphalt concrete. Dist. VI, Rt. 4, Section E. Geo. H. Oswald, Los Angeles, \$336,662; Peninsula Paving Company, San Francisco, \$320,722; Clark & Henery Const. Co., San Francisco, \$363,644; Gibbons & Reed Company, Burbank, \$345,166; David H. Ryan, San Francisco, \$308,256; Valley Paving and Const. Co., Fresno, \$307,506; Hanrahan Company, San Francisco, \$318,568; contract awarded to Union Paving Co., San Francisco, \$305,561.

TUOLUMNE COUNTY—About 1.9 miles new hog-tight property fence to be constructed from Keystone to 1½ miles west. Dist. X, Rt. 13, Section A. E. C. Fisher & Sons, Vacaville, \$1,499; Anchor Post Fence Co. of California, San Francisco, \$1,866; Edw. R. Jameson, Sacramento, \$1,302; contract awarded to B. C. Burnett, Turlock, \$1,299.

TUOLUMNE AND MARIPOSA COUNTIES—Treating with light and heavy fuel oil between Priest's Hotel and Yosemite National Park, 38.9 miles. Dist. X, Rt. 18-40, Section A, B, C, D, E, F and A. Pacific Tank Lines, Inc., Los Angeles, \$12,421; C. W. Wood, Stockton, \$12,359; contract awarded to Basalt Rock Co., Inc., Napa, \$11,890.

YUBA, NEVADA, SIERRA COUNTIES—Treating with light fuel oil, between 7 miles north of Rough and Ready and between Nevada City. Dist. III, Rt. 15-25, Section Yub-Nev-15-A, B and Nev-Yub-Sie-25-A. Jack Casson, Hayward, \$7,879; D. McDonald, Sacramento, \$8,015; Pacific Tank Lines, Inc., Los Angeles, \$10,336; Basalt Rock Co., Inc., Napa, \$8,917; contract awarded to Clyde W. Wood, Stockton, \$7,461.

The amount of Federal-aid funds allocated for road-building projects during February was the largest on record for any month, and was about two and one-half times the largest amount set aside in any February since 1925, according to an oral statement March 16 by R. E. Royall, senior highway engineer of the Bureau of Public Roads.

Don't throw the conversation into high until the brain is turning over.—Charles H. Barr.

WATER APPLICATIONS AND PERMITS

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of April, 1930.

SAN DIEGO COUNTY—Application 6928. Victoria I. Edwards, Route 1, Box 851-D, San Diego, Calif., for 0.5 c.f.s. from Beaver Creek tributary to Sweetwater River. To be diverted in Section 25, T. 16 S., R. 1 E., S. B. B. and M., for irrigation and domestic purposes (80 acres). Estimated cost \$1,000.

TUOLUMNE COUNTY—Application 6929. F. W. and Stella G. Ross, 2253 East Church Street, Stockton, Calif., for 0.08 c.f.s. from four unnamed springs and an unnamed stream tributary to Moccasin Creek and Tuolumne Creek. To be diverted in Section 35, T. 1 S., R. 16 E., M. D. B. and M., for irrigation and domestic purposes (5 acres). Estimated cost \$100.

MENDOCINO COUNTY—Application 6930. Amanda P. Day, Cummings, Calif., for 0.087 c.f.s. from Bear Creek tributary to Dann Creek, thence S. Fork Eel River. To be diverted in Section 7, T. 23 N., R. 16 W., M. D. B. and M., for irrigation and domestic purposes (5 acres).

PLACER COUNTY—Application 6931. Fred E. Lazenby, 3065 Washington Avenue, Ogden, Utah, for 3 c.f.s. from seven unnamed springs. To be diverted in Section 1, T. 13 N., R. 6 E., M. D. B. and M., for irrigation and domestic purposes. Estimated cost \$500.

RIVERSIDE COUNTY—Application 6932. Sidney E. Bartlett, 606 Pacific Southwest Bldg., Long Beach, Calif., for 0.5 c.f.s. from unnamed seepage or waste water tributary to Santa Ana River. To be diverted in Section 36, T. 3 S., R. 5 W., S. B. B. and M., for irrigation purposes (10 acres).

SUTTER COUNTY—Application 6933. D. C. Smith, Meridian, Calif., for 3 c.f.s. from Butte Slough tributary to Sacramento River. To be diverted in Section 36, T. 16 N., R. 1 W., M. D. B. and M., for irrigation purposes (238.2 acres). Estimated cost \$1,200.

ALPINE COUNTY—Application 6934. George Hussman, Gardnerville, Nevada, for 125 acre-feet per annum from Nobel Lake tributary to Carson River. To be diverted in Section 4, T. 8 N., R. 20 E., M. D. B. and M., for irrigation purposes (300 acres).

NEVADA COUNTY—Application 6935. Central Pacific Railway Co., c/o Frank Thunen, Att'y, 65 Market St., San Francisco, Calif., for 1.5 c.f.s. and 140 acre-feet per annum from Donner Creek tributary to Truckee River. To be diverted in Section 16, T. 17 N., R. 16 E., M. D. B. and M., for industrial (General Railroad Purposes) and domestic purposes. Estimated cost \$30,000.

SAN JOAQUIN COUNTY—Application 6936. O. C. Cuts, c/o Ohm and Raab, Engineers and Surveyors, 517 E. Market St., Stockton, Calif., for 1.0 c.f.s. from San Joaquin tributary to Suisun Bay. To be diverted in Section 21, T. 1 N., R. 9 E., M. D. B. and M., for irrigation purposes (79 acres). Estimated cost \$10,000.

SISKIYOU COUNTY—Application 6937. California Oregon Power Co., Inc., c/o Brobeck, Phleger and Harrison, Att'ys., Crocker Bldg., San Francisco, Calif., for 3,000 c.f.s. from Klamath River tributary to Pacific Ocean. To be diverted in Section 9, T. 47 N., R. 5 W., M. D. B. and M., for power purposes (54,545 H.P.). Estimated cost \$4,500,000.

FRESNO COUNTY—Application 6938. Consolidated Irrigation District, Stockton, Calif., for 1000 c.f.s. and 200,000 acre-feet per annum from San Joaquin River tributary to San Francisco Bay. To be diverted in Section 5, T. 11 S., R. 21 E., M. D. B. and M., for irrigation and domestic purposes (149,500 acres).

KERN AND VENTURA COUNTIES—Application 6939. Florence Louise Cuddy, Lebec, Calif., for 200,000 gallons per day from four unnamed springs tributary to Cuddy Canyon, thence San Joaquin Valley. To be diverted in Sections 3 and 10, T. 8 N., R. 20 W., S. B. B. and M., and Section 28, T. 9 N., R. 20 W., S. B. B. and M., for recreational and domestic purposes. Estimated cost \$3,000.

PLACER COUNTY—Application 6940. Pacific Gas and Electric Co., Attention: P. M. Downing, 1st Vice President and General Manager, 245 Market St., San Francisco, Calif., for 120 c.f.s. from the augmented flow of Bear River tributary to Feather River. To

be diverted in Section 22, T. 15 N., R. 9 E., M. D. B. and M., for irrigation purposes.

PLACER COUNTY—Application 6941. Pacific Gas and Electric Co., Attention: P. M. Downing, 1st Vice President and General Manager, 245 Market St., San Francisco, Calif., for 50 c.f.s. from augmented flow of Bear River tributary to Feather River. To be diverted in Sec. 3, T. 13 N., R. 8 E., M. D. B. and M., for irrigation purposes.

EL DORADO COUNTY—Application 6942. David M. Rounds, Camino, Calif., for 0.075 c.f.s. from Iowa Creek tributary to South Fork of American River. To be diverted in Sec. 23, T. 11 N., R. 12 E., M. D. B. and M., for irrigation and domestic purposes (15 acres). Estimated cost \$7,500.

NEVADA COUNTY—Application 6943. Gaston Gold Mines, Ltd., c/o Geo. St. John, 2801 Telegraph Ave., Berkeley, Calif., for 300 acre-feet per annum from South Fork of Poorman's Creek tributary to South Fork of Yuba River. To be diverted in Sec. 21, T. 18 N., R. 11 E., M. D. B. and M., for power purposes.

SONOMA COUNTY—Application 6944. Sonoma State Home, Department of Institutions, State of Calif., c/o J. M. Toner, M.D., Director, Sacramento, Calif., for 0.55 c.f.s. and 250 acre-feet per annum from Sonoma Creek tributary to San Pablo Bay. To be diverted in Sec. 22, T. 6 N., R. 6 W., M. D. B. and M., for irrigation and domestic purposes (131 acres to be irrigated). Estimated cost \$7,500.

BUTTE COUNTY—Application 6945. K. Jacobson, Box 363, Gridley, Calif., for 3 c.f.s. from Main Drain of Reclamation District 2054 tributary to Sacramento River. To be diverted in Sec. 16, T. 17 N., R. 2 E., M. D. B. and M., Sec. 21, T. 17 N., R. 2 E., M. D. B. and M., for irrigation purposes (312 acres). Estimated cost \$300.

TRINITY COUNTY—Application 6946. Colon F. Whittier, c/o Geo. Hordenholt, 6327 W. 5th St., Los Angeles, Calif., for 100 c.f.s. from Soldier Creek tributary to Trinity River. To be diverted in Sec. 25, T. 33 N., R. 11 W., M. D. B. and M., for mining and domestic purposes.

DEL NORTE COUNTY—Application 6947. Frank Johnston, Box 298, Crescent City, Calif., for 2 c.f.s. from unnamed creek tributary to Middle Fork of Smith River. To be diverted in Sec. 18, T. 17 N., R. 3 E., H. B. and M., for mining and domestic purposes. Estimated cost \$300.

DAM APPLICATIONS, APPROVALS FOR APRIL

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of April, 1931.

LASSEN COUNTY—Permit 3672, Application 6398. Antone Avilla, Adin, Calif., April 3, 1931, for 33 acre-feet per annum from Quaking Asp Gulch in Sec. 7, T. 36 N., R. 10 E., M. D. M., for stock watering purposes. Estimated cost \$2,000.

LASSEN COUNTY—Permit 3673, Application 6417. Antone Avilla, Adin, Calif., April 3, 1931, for 30 acre-feet per annum from Quaking Asp Gulch in Sec. 13, T. 36 N., R. 9 E., M. D. M., for stock watering purposes. Estimated cost \$2,000.

PLACER COUNTY—Permit 3674, Application 6828. Archie L. Ware, Lincoln, Calif., April 3, 1931 for 0.25 cubic foot per second from (1) a spring (2) unnamed stream in Sec. 1, T. 13 N., R. 6 E., M. D. M., for irrigation and domestic purposes on 38.17 acres. Estimated cost \$1,000.

EL DORADO COUNTY—Permit 3675, Application 6650. H. V. Madden, Uacerville, Calif., April 4, 1931 for 11 acre-feet per annum from Emigrant Ravine in Sec. 4, T. 10 N., R. 11 E., M. D. M., for irrigation purposes on 35 acres. Estimated cost \$2,000.

MENDOCINO COUNTY—Permit 3676, Application 6854. C. D. and Anna D. Flowers, Ukiah, Calif., April 8, 1931 for 0.3 cubic feet per second from Russian River in Sec. 4, T. 14 N., R. 12 W., M. D. M., for irrigation purposes on 24 acres. Estimated cost \$2,800.

MENDOCINO COUNTY—Permit 3677, Application 6855. J. C. Crawford, Ukiah, Calif., April 8, 1931 for 0.6 cubic feet per second from Russian River in Sec. 4, T. 14 N., R. 12 W., M. D. M., for irrigation purposes on 53.61 acres. Estimated cost \$2,800.

BUTTE COUNTY—Permit 3678, Application 6204. Paradise Irrigation District, Paradise, Calif., April 9, 1931 for 5000 acre-feet per annum maximum rate of diversion not to exceed 50 cubic feet per second from Little West Branch in Sec. 32, T. 24 N., R. 4 E., M. D. M., for irrigation purposes on 11,000 acres. Estimated cost \$362,000.

HUMBOLDT COUNTY—Permit 3679, Application 6850. Frederick Bradshaw, Weaverville, Calif., April 9, 1931 for 125 cubic feet per second from Horse Linto Creek in Sec. 15, T. 7 N., R. 6 E., H. M. for mining purposes. Estimated cost \$200,000.

PLUMAS COUNTY—Permit 3680, Application 6784. Mt. Lassen Area Council Boy Scouts of America, Chico, Calif., April 9, 1931 for 0.2 cubic foot per second from Yellow Creek in Sec. 7, T. 26 N., R. 7 E., M. D. for recreational purposes. Estimated cost \$2,000.

LAKE COUNTY—Permit 3681, Application 6863. Leavitt Mead McQuesten, Upper Lake, Calif., April 10, 1931 for 0.31 cubic foot per second from Clover Creek in Sec. 6, T. 15 N., R. 9 W., M. D. M., for irrigation purposes on 25 acres. Estimated cost \$250.

RIVERSIDE COUNTY—Permit 3682, Application 6815. Charles A. Black, Banning, Calif., April 10, 1931 for 0.006 cubic foot per second from unnamed spring in Sec. 7, T. 4 S., R. 2 E., S. B. for domestic purposes. Estimated cost \$175.

SANTA CRUZ COUNTY—Permit 3683, Application 6833. Theodore J. Hoover, Swanton, Calif., April 13, 1931 for 4.79 cubic feet per second from Waddell Creek in Sec. 35, T. 9 S., R. 4 W., M. D., for irrigation purposes. Estimated cost \$25,000.

RIVERSIDE COUNTY—Permit 3684, Application 6825. Edward Molitor, Keen Camp, Calif., April 15, 1931 for .05 c.f.s. from unnamed stream in Sec. 26, T. 5 S., R. 3 E., S. B. for irrigation and domestic purposes on 20 acres. Estimated cost \$600.

MONO COUNTY—Permit 3685, Application 6879. Edith Raymer, Bishop, Calif., April 17, 1931 for 0.005 cubic foot per second from Convict Creek in Sec. 11, T. 4 S., R. 28 E., M. D., for domestic purposes. Estimated cost \$500.

HUMBOLDT COUNTY—Permit 3686, Application 6832. Emmett Lewis, Korb, Calif., April 17, 1931 for .062 cubic foot per second from unnamed stream in Sec. 7, T. 3 N., R. 4 E. H., for irrigation and domestic purposes.

RIVERSIDE COUNTY—Permit 3687, Application 6843. Arthur Nightingale, Hollywood, Calif., April 17, 1931 for 0.009 cubic foot per second from Onestott Creek in Sec. 10, T. 7 S., R. 5 E., S. B., for domestic purposes. Estimated cost \$500.

BUTTE COUNTY—Permit 3688, Application 6755. A. A. McMullen, Yuba City, Calif., April 18, 1931 for 0.1 cubic foot per second from branch of Ram Creek in Sec. 32, T. 22 N., R. 6 E., M. D., for irrigation and domestic purposes on 8 acres.

RIVERSIDE COUNTY—Permit 3689, Application 6848. Grace L. Williams, Lake Arrowhead, Calif., April 18, 1931 for 2160 gallons per day from unnamed spring in Sec. 2, T. 6 S., R. 2 E., S. B., for domestic purposes. Estimated cost \$250.

INYO COUNTY—Permit 3690, Application 6860. W. C. Parcher, Bishop, Calif., April 20, 1931, for 2.5 cubic feet per second from Green Creek in Sec. 3, T. 9 S., R. 31 E., M. D., for power purposes. Estimated cost \$250.

INYO COUNTY—Permit 3691, Application 6861. W. C. Parcher, Bishop, Calif., April 20, 1931 for .008 cubic foot per second from Green Creek in Sec. 2, T. 9 S., R. 21 E., M. D. for domestic purposes. Estimated cost \$265.

EL DORADO COUNTY—Permit 3692, Application 6851. John J. Scherer, Macerville, Calif., April 21, 1931 for 0.025 cubic foot per second from unnamed spring in Sec. 18, T. 10 N., R. 11 E., M. D. for domestic purposes.

ORANGE COUNTY—Permit 3693, Application 6881. C. C. Cravath, Laguna Beach, Calif., April 21, 1931 for 200 gallons per day from spring in Sec. 33, T. 6 S., R. 6 W., S. B. for domestic purposes. Estimated cost \$10.

DEL NORTE COUNTY—Permit 3694, Application 6878. Walter G. Muncy, Crescent City, Calif., April 21, 1931 for 2000 gallons per day from Kelly's Gulch in Sec. 27, T. 17 N., R. 2 E., H., for irrigation and domestic purposes on 2 acres.

MODOC COUNTY—Permit 3695, Application 6518. I. C. Exley and Roy V. Exley, Davis Creek, Calif., April 21, 1931 for 332 acre-feet per annum from (1) Fletcher Creek (2) Drainage area of Exley Reservoir in Sec. (1) 15 (2) 26, T. 47 N., R. 12 E., M. D.

for irrigation purposes on 320.6 acres. Estimated cost \$1,000.

SISKIYOU COUNTY—Permit 2696, Application 6855, W. A. Sergeant, Dorris, Calif., April 28, 1931 for 2 cubic feet per second from Cottonwood Creek in Sec. 7, T. 47 N., R. 2 E., M. D., for irrigation purposes on 160 acres. Estimated cost \$50.

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of April, 1931.

MODOC COUNTY—Barn's Dam No. 146-2. Hoy and Cristen, Alturas, owners; 12 feet above streambed with a storage capacity of 100 acre-feet, situated on Pit River tributary to Sacramento River in Sec. 8, T. 4 N., R. 12 E., M. D. B. and M., for diversion purposes, for irrigation use.

MODOC COUNTY—Spicer Dam No. 146-3. Hoy and Cristen et al, Alturas, California, owners; earth and rock, 10 feet above streambed with a storage capacity of 200 acre-feet, situated on Pit River tributary to Sacramento River in Sec. 9, T. 42 N., R. 12 E., M. D. B. and M., for diversion purposes, for irrigation use.

MODOC COUNTY—Clausen Ranch Dam No. 163. Modoc County Bank, Alturas, California, owner; rock crib dam, 4.33 feet above streambed, situated on Pit River tributary to Sacramento River in Sec. 1, T. 41 N., R. 10 E., M. D. B. and M., for diversion purposes, for irrigation use.

MODOC COUNTY—Green Dam No. 167. A. M. Green, Canby, California, owner; rock crib-flashboards, located in Sec. 2, T. 41 N., R. 10 E., M. D. B. and M., for diversion purposes, for irrigation use.

SAN JOAQUIN COUNTY—Davis Dam No. 572. Mrs. Laura M. Davis, Linden, owner; earth dam, located in Sec. 6, T. 2 N., R. 9 E., M. D. B. and M., for storage purposes for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of April, 1931.

NEVADA COUNTY—Donner Creek Dam No. 311-17. Central Pacific Railway Company, San Francisco, owner; earthfill, 14 feet above streambed with a storage capacity of 140 acre-feet, situated on Donner Creek tributary to Truckee River in Sec. 16, T. 17 N., R. 16 E., M. D. B. and M., for storage and diversion purposes for railroad use. Estimate cost \$1,100. Fees paid \$20.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of April, 1931.

NEVADA COUNTY—Upper Rock Lake Dam No. 97-48. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on small creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Upper Lindsay Lake Dam No. 97-46. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Lower Rock Lake Dam No. 97-38. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

SANTA CLARA COUNTY—Williams Dam No. 622-4. San Jose Water Works, San Jose, owner; gravity, situated on Los Gatos Creek, located in Rancho Soquel Augmentation.

NEVADA COUNTY—Blue Lake Dam No. 97-12. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Rucker Creek tributary to South Yuba River in Sec. 9, T. 17 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown-Willamette Paper Company, San Francisco, owner; crib dam, situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

SHASTA COUNTY—Coleman Forebay Dam No. 97-83. Pacific Gas and Electric Company, San Fran-

cisco, owner; earth and rock dam, located in Sec. 32, T. 30 N., R. 2 W., M. D. B. and M.

NEVADA COUNTY—Cullbertson Dam No. 97-17. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

LOS ANGELES COUNTY—Live Oak Dam No. 32-7. Los Angeles County Flood Control District, Los Angeles, owner; gravity arches dam, situated on Live Oak Creek tributary to San Jose Creek in Sec. 32, T. 1 N., R. 8 W., S. B. B. and M.

LOS ANGELES COUNTY—San Dimas Dam No. 32-10. Los Angeles County Flood Control District, Los Angeles, owner; gravity arches, situated on San Dimas Creek tributary to Puddingstone Creek in Sec. 24, T. 1 N., R. 9 W., S. B. B. and M.

LOS ANGELES COUNTY—Saw Pit Dam No. 32-12. Los Angeles County Flood Control District, Los Angeles, owner; arch, situated on Sawpit Creek tributary to San Gabriel River in Sec. 13, T. 1 N., R. 11 W., S. B. B. and M.

PLACER COUNTY—Mammoth Dam No. 97-39. Pacific Gas and Electric Company, San Francisco, owner; earth dam, located in Sec. 12, T. 11 N., R. 7 E., M. D. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of April, 1931.

HUMBOLDT COUNTY—Benbow Dam No. 106. Benbow Power Company, Benbow, owner; ambursen, 17½ feet above streambed with a storage capacity of 780 acre-feet, situated on South Fork Eel River tributary to Eel River in Sec. 36, T. 4 S., R. 3 E., H. B. B. and M., for storage purposes, for power use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of April, 1931.

PLACER COUNTY—Kidd Lake Dam No. 97-25. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on a small creek tributary to South Yuba River in Sec. 29, T. 17 N., R. 14 E., M. D. B. and M.

TUOLUMNE COUNTY—Matelot Dam No. 97-75. Pacific Gas and Electric Company, San Francisco, owner; earth dam, located in Sec. 1, T. 2 N., R. 14 E., M. D. B. and M.

TUOLUMNE COUNTY—San Diego Dam No. 97-82. Pacific Gas and Electric Company, San Francisco, owner; earth dam, located in Sec. 13, T. 2 N., R. 14 E., M. D. B. and M.

SANTA CLARA COUNTY—Williams Dam No. 622-4. San Jose Water Works, owner; gravity, situated on Los Gatos Creek in Rancho Soquel Augmentation.

NEVADA COUNTY—Blue Lake Dam No. 97-12. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on Rucker Creek tributary to South Yuba River in Sec. 9, T. 17 N., R. 12 E., M. D. B. and M.

PLACER COUNTY—Lower Peak Dam No. 97-37. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on a small creek tributary to South Yuba River in Sec. 30, T. 17 N., R. 14 E., M. D. B. and M.

NEVADA COUNTY—Meadow Lake Dam No. 97-49. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on a small creek tributary to Fordyce creek in Sec. 27, T. 13 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Rucker Lake Dam No. 97-44. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Rucker Creek tributary to South Yuba River in Sec. 8, T. 17 N., R. 12 E., M. D. B. and M.

PLACER COUNTY—Upper Peak Lake Dam No. 97-47. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on a small creek tributary to South Yuba River in Sec. 32, T. 17 N., R. 14 E., M. D. B. and M.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown-Willamette Paper Company, San Francisco, owner; crib, situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

NEVADA COUNTY—Lower Rock Dam No. 97-38. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Upper Lindsay Lake Dam No. 97-46. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, situated on Texas Creek tributary to South Yuba River in Sec. 21, T. 18 N., R. 12 E., M. D. B. and M.

NEVADA COUNTY—Upper Rock Lake Dam No. 97-48. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on a small creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

SHASTA COUNTY—Coleman Forebay Dam No. 97-87. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, located in Sec. 32, T. 30 N., R. 2 W., M. D. B. and M.

NEVADA COUNTY—Culbertson Dam No. 97-17. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 15, T. 18 N., R. 12 E., M. D. B. and M.

ARCHITECTURAL AWARDS For Month of April

SAN DIEGO STATE TEACHERS COLLEGE—Club Building and Scripps Cottage; to H. Mayson, Los Angeles, \$20,958.

AGRICULTURAL PARK (State Fair Grounds), Sacramento—General work on Poultry Building, to Guth & Fox, Sacramento, \$48,826; for electrical work, to J. W. Thomas, Sacramento, \$1,750; for plumbing work to Carpenter & Mendenhall, Sacramento, \$5,974.

CALIFORNIA POLYTECHNIC SCHOOL, San Luis Obispo—General work on Boys' Dormitory No. 4, to Wigg Construction Co., Redondo Beach, \$23,195; for plumbing work to American Engineers & Contractors, Los Angeles, \$3,169; for heating work to W. A. Aschen, Oakland, \$2,629; for electrical work to Electric Company, Santa Barbara, \$1,164.

FOLSOM STATE PRISON—Mechanical equipment for four sewage aerators to Water Works Supply Company, San Francisco, \$6,000.

DISTRICT FIVE OFFICE BUILDING, San Luis Obispo—General work to H. J. Smith, San Luis Obispo, \$21,939; for plumbing work to Carl T. Doell Company, Oakland, \$2,654; for heating work to Thomas Haverly Company, Los Angeles, \$2,342; for electrical work to California Electric Company, Santa Barbara, \$1,196.

NORWALK STATE HOSPITAL—Quarters for Night Attendants, Quarters for Day Attendants and Assistant Physician's Residence—For general work to C. Haverlandt, Long Beach, \$53,861; for plumbing and heating to Coony & Winterbottom, Los Angeles, \$11,124; for electrical work to R. R. Jones Electrical Company, Pasadena, \$2,520.

Census Taker: "What is your husband's name?"

Mrs. Murphy: "Pat."

Census Taker: "I want his full name."

Mrs. Murphy: "Well, when he's full, he thinks he's Gene Tunney."

Here's how the average man spends his "three score and ten":

Sleeps 23 years and four months. Works 19 years and eight months. Plays and prays ten years and two months. Eats and drinks six years and ten months. Dresses and undresses two years. Travels four years. Sick and convalesces four years. Total, 70 years.—*Exchange.*

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official Journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON-----Director
GEORGE C. MANSFIELD-----Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9

MAY, 1931

No. 5

GOVERNOR ROLPH OPENS NEW UNIT OF BAYSHORE HIGHWAY

(Continued from page 2.)

cisco to Redwood City, to nearly \$4,000,000. These figures are exclusive of the construction of the Bayshore Boulevard within the city limits of San Francisco, which gives access to the heart of the city at almost any point desired.

BRIDGE COMPLETED

The bridge across Redwood Slough, at Redwood City, has been completed. A bridge across San Francisquito Creek, the county line between San Mateo and Santa Clara counties, is now being constructed; and an underpass under the Dumbarton branch of the Southern Pacific Railway will be under construction inside of a few weeks. The surfacing of the section between Redwood City and Willow Road—the latter being the county highway connecting to the Dumbarton Bridge a short distance east of the Bayshore Highway—and the grading and surfacing between Willow Road and Oregon Avenue will be commenced this summer for early completion, at which time there will be another seven-mile strip opened to the use of the traveling public.

PURPOSE OF ROAD

The Bayshore Highway has been designed for the primary purpose of fast express travel between the cities of San Francisco and San Jose, and for this reason it skirts the edge of the bay by passing the business sections, in so far as possible, of all cities and towns along its route. However, the construction of the new Western Pacific line east of this highway into San Francisco, and the consummation of harbor facilities and developments already in progress, or contemplated for the near future, will assure the rapid industrial development of the entire section which this important highway traverses.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

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COLONEL WALTER E. GARRISON-----Director

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T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

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F. G. SOMNER, District IX, Bishop

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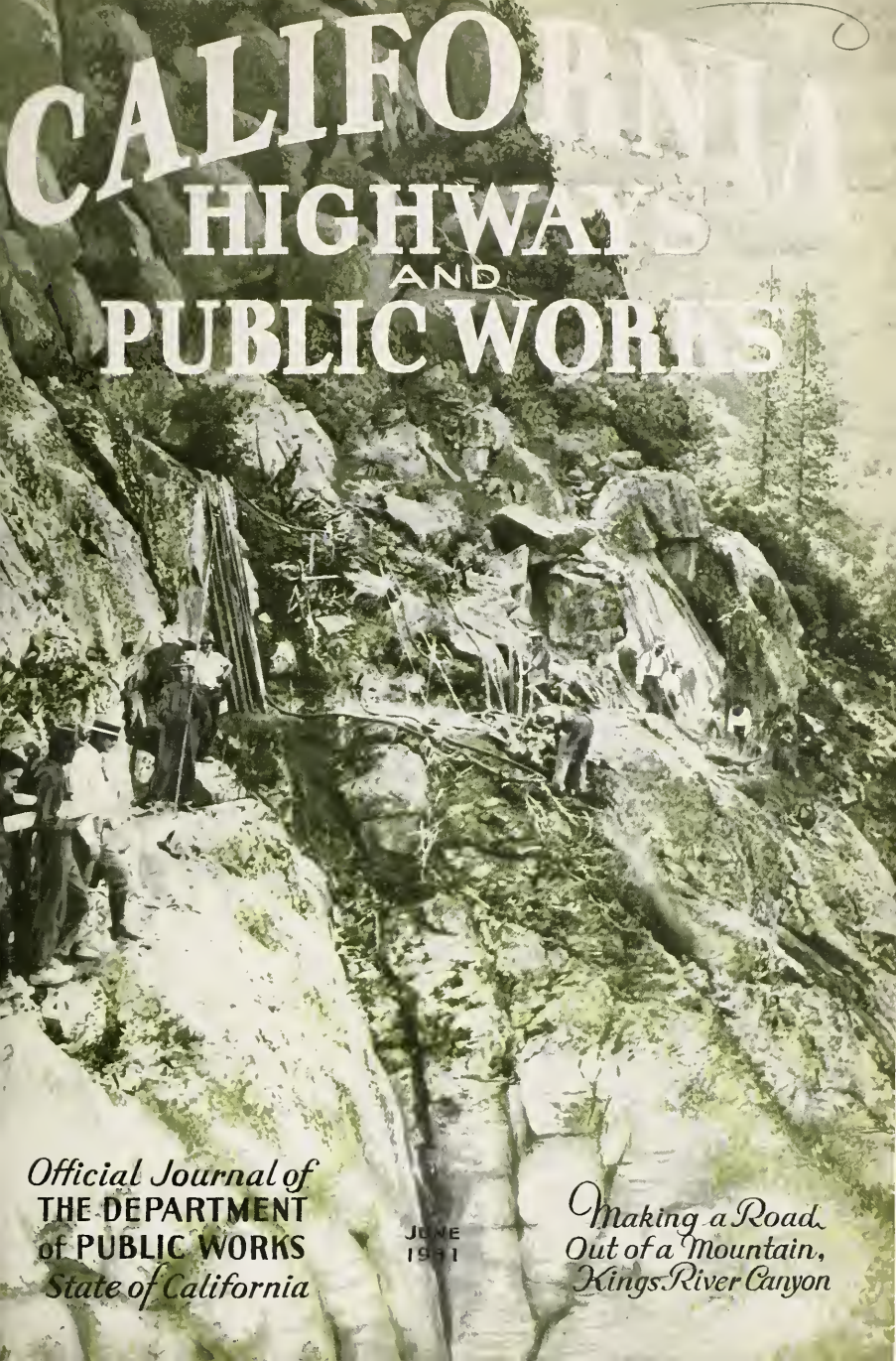
DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

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CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official Journal of
THE DEPARTMENT
of PUBLIC WORKS
State of California

JUNE
1941

*Making a Road
Out of a Mountain,
Kings River Canyon*

JUL 6 1937

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STOP *Red Menace* By *Preventing* FIRES

CITING extreme water shortage, high temperature and low humidity as alarming factors increasing the fire hazard this summer in the forests and fields of California, Governor James Rolph, Jr., coordinating all his available agencies in the State government, has organized by proclamation the California Fire Emergency Committee to combat the situation through an educational campaign.

With Governor Rolph as honorary chairman, and Charles S. Howard, San Francisco, directing chairman, the headquarters of the Fire Emergency Committee have been placed in the Division of Forestry, Department of Natural Resources, with State Forester M. B. Pratt as executive secretary in direct charge of the activities of the committee.

According to information from the secre-



Charles S. Howard

tary's office the campaign was in full swing on May 20th, the day following the issuance of Governor Rolph's proclamation. Within three days, more than 7000 men officially in direct contact with the forests and fields of California were patrolling against fires in their respective lines of duty.

In the coordinated State agencies, Col. Walter E. Garrison, Director of Public Works, was the first leader in issuing instructions to his field forces for fire prevention activities as outlined in the proclamation. This lead was quickly followed by Superintendent E. Raymond Cato, Highway Patrol; President I. Zellerbach, Fish and Game Commission; Director Daniel H. Blood, Department of Natural Resources; Avery S. Hoyt, Director of Agriculture; and Vierling Kersey, Director of Education.

(Continued on page 16.)



M. B. Pratt

San Francisco-Oakland Bay Bridge May Be Completed by July, 1937

1 1 1 1 1 1

THE San Francisco-Oakland Bay Bridge completed by July, 1937!

That's the hope held out by Charles H. Purcell, State Highway Engineer.

He anticipates that design work will proceed with sufficient rapidity to be able to determine an accurate estimate of the entire project by July 1, 1932, so that bonds may be sold immediately thereafter.

Progress toward starting actual construction of the great project has been largely along the lines of legislative action, by the recent Legislature, and on preliminary field engineering and preliminary design.

The 1931 Legislature has passed very important legislation on this subject and by so doing has assured early commencement of work on the actual design and construction of the bridge.

The legislation referred to was sponsored by Governor Rolph and his administration, together with prominent members of the Senate and Assembly.

NEW BILLS PASSED

Two new bills were passed and the former Toll Bridge laws amended in such a way as to make them more practical in their application to the problem.

Senate Bill No. 460 introduced by Senator Fellom made certain minor changes in the former Toll Bridge law which render it more workable in its application to the general toll bridge problem of the State.

Senate Bill No. 337, introduced by Senators Fellom, Tubbs, Maloney, Breed, Jones, Young, Crittenden, Sharkey, Inman and McCormack, appropriates the sum of \$650,000 out of the general fund to be expended by the Department of Public Works for the purpose of preliminary engineering and design of the bridge. This appropriation is made in the form of a loan to be repaid with 4 per cent interest out of the first bond issue.

IMPORTANT STEP

It is a very important step toward construction of the bridge and establishes beyond doubt the faith of the Legislature in the project and should be a strong influence toward favorable sale of bonds.

Senate Bill No. 336, introduced by Senators Fellom and Breed, stipulates that the Department of Public Works may accept and adopt, for purposes of maintenance only, said highway crossing as a State highway at such time as it may deem it for the best interests of the State. The wording of this bill is susceptible of broad interpretation. Under it the Department of Public Works may use State highway funds for maintenance after the bridge is completed. As a result, this action of the Legislature has a very favorable influence on the sale of bonds for the project because maintenance of the structure is guaranteed out of funds other than those received from income from tolls.

These three bills were signed by Governor Rolph May 25th. More than 70 prominent business, civic and labor leaders attended the ceremonies in the Governor's office.

SURVEYS COMPLETED

The appropriation of \$650,000 for engineering will not become available until August 15th because of the 90-day period required by law after adjournment of the Legislature. For this reason intensive effort on the design of the bridge can not go ahead until that time. There has been, however, certain small amounts available for preliminary work from the former money made available by the 1929 Legislature and the cities of San Francisco and Oakland.

Surveys of Yerba Buena Island for the necessary right of way over government property, required in the War Department permit, have been completed and right of way maps will soon be completed. Formal application for the final permit will then be made to the War Department. This permit has already been approved by the War Department with the provision that rights of way be obtained across Yerba Buena Island. The filing of the maps will comply with this stipulation. The War, Navy and Commerce departments, all of whom have reservations on the island, have given the department the fullest cooperation and no delay is anticipated in obtaining their approval.

In addition to the right of way surveys, work is being started on key maps of the



IS EVERYBODY HAPPY? They look it. It's the occasion of the signing of the three San Francisco-Oakland Bay Bridge bills by Governor Rolph, signalling realization of a dream come true. Congressman Richard Welch, E. B. de Golia, President of San Francisco-Oakland Bay Bridge Commission, the Governor and Col. Walter E. Garrison are seen in the front row as the Governor is handed the pen to sign the first measure. In the second row from left to right are: Senator Thomas Maloney, Judge George Steiger, Rolland A Vandegrift, Director of Finance, Senator Roy Fellom, Charles H. Purcell, State Highway Engineer, Earl Lee Kelly, Chairman Highway Commission, Mayor Davie of Oakland, Timothy Reardon, Highway Commissioner, and Mayor Rossi of San Francisco. And below, the happy delegation on the steps of the Capitol after the signing.

entire area affected by the bridge and approaches. This map will give all the physical data, contours, buildings, tracks and public service equipment involved and will form a basis for final studies of the entire bridge layout and approaches.

Work on preliminary triangulation has been started. Control monuments are being set and their exact locations determined. These will be used to locate borings, piers and all physical parts of the structure.

An engineering organization has been formed in the East Bay area, composed of the

various city engineers of the cities involved. This committee has made studies of the general street systems of the East Bay and has made a preliminary report on procedure. They will further cooperate with the Department of Public Works' engineers in working out a proper distribution system in the East Bay. The City Engineer's Office of San Francisco has been of great assistance in furnishing maps and data on the areas affected by the bridge approaches.

One of the first problems to be met is the moving of numerous submarine cables which

(Continued on page 5.)

Californians! Stop, Read and Heed!

By CHARLES H. PURCELL, State Highway Engineer

DESPITE the fact that California, a pioneer in highway development, has expended to date on its highway system a total of approximately \$225,000,000, we have not kept pace with the majority of states in the Union. Forty-four others have a greater per capital expenditure than California!

Further we rank only fifteenth in the United States in the percentage of paved highways!

And yet this State ranks second in motor vehicle registration and sixth in population.

And merely to serve adequately the traffic over our roads for the ten-year period ending 1940, the Division of Highways estimates \$365,000,000 will be needed for maintaining and improving the highway system.

These facts may startle the average Californian who firmly believes this State a leader in road making. So let me clear up this mistaken belief.

The present status of the California State Highway System is:

Mileage paved (concrete, asphalt or bituminous macadam)-----	2591
Mileage surfaced (rock or oiled rock)-----	1915
Mileage unsurfaced (earth)-----	1831
Total -----	6337

Only 34.4 per cent of the California Highway System is now paved, while 14 other states have a higher percentage paved.

The total mileage surfaced and paved is 4506, which ranks California nineteenth among the states for this item, and three states have their entire state highway system surfaced.

During the year 1930 California improved or surfaced approximately 550 miles of the State Highway System, while 28 states exceeded this figure.

Considering population and motor vehicle registration the present state of improvement of the California State Highway System is below the average for other states of comparable population and motor vehicle registration. Not only is this true, but the present rate of State highway expenditure is still below the average annual State highway expenditure in those states.

The Division of Highways of California has, during the past two years, completed a thorough engineering and economic study of State highway needs and finances in California for the ten-year period ending 1940. A thorough study was made of the improvements necessary to serve traffic during this ten-year period as well as of the funds which will become available during that period.

The estimated cost of maintenance and improving the State highway system, not to the ultimate standard of pavement, but to the standard adequate properly to serve the traffic during this period is \$365,000,000. The estimated revenue, under existing laws, for State highway purposes is \$320,000,000.

There can be no diversion of State highway funds without seriously damaging the improvement of our State highway system and further lowering California's position when compared to the State highway development in other states.

The modern highway is a paying investment and is essential to the social and economic development of our country.

DO YOU KNOW THAT	
California measures up against the other forty-seven States in the Union as follows:	
In population-----	Sixth
Motor vehicle registration-----	Second
Percentage of paved State highway-----	Fifteenth
Per capita expenditure for State highways-----	Forty-fifth
Mileage of highways improved in 1930-----	Twenty-ninth
Total mileage of State highways paved and surfaced-----	Nineteenth

Models to Decide Bridge Safety

ONE-HUNDREDTH the size of the actual structure to be built, but complete in every detail, miniature bridges are to be constructed by scientists as models for the gigantic San Francisco-Oakland Bay Bridge. From these models will be chosen the type of structure to cross San Francisco Bay.

This is the announcement of Charles H. Purell, State Highway Engineer, in making public the fact that Prof George E. Beggs of Princeton University, one of the foremost bridge experts in the world, had consented to work with the University of California at Berkeley in constructing models.

The effect of all loads, wind, temperature—indeed all the elements will be tested with the models.

Every detail of the mammoth bridge will be put into the structural models of the several possible types of design; even the same kind of material to be used.

Each model will be "loaded" in the same

proportion as the full-sized bridge would be, thus permitting the scientists to measure the actual stress upon the structure together with the deflections in temperature ranges.

In this way the safety of the structure is actually proved before it is built.

Dr. Beggs, leading authority on model bridge building, constructed the miniatures for the Mount Hope Bridge.

He is now in California on his Sabbatical year and had planned to take his family on a yacht cruise to Alaska. So interested, however, has he become in the mammoth task of bridging the bay, that he has given up his cruise and will begin actual scientific work this week.

He will be assisted, not only by the University of California scientists under Professor Davis, but a corps of Department of Public Works engineers under Purell and Charles E. Andrew, the department bridge engineer.

Work Being Rushed on Bay Bridge

(Continued from page 3.)

are now in the vicinity of the bridge center line. These cables must be moved before final borings are started and before pier work can proceed.

The very important detail of determining the type of structure to be used between San Francisco and Yerba Buena Island is being developed as rapidly as limited funds will permit. Studies and plans of numerous types have been made and preliminary cost estimates determined. Types studied involve cantilever and suspension type.

Studies to date indicate that a double simple suspension type with central anchorage is desirable from an economic standpoint when simplicity and safety are considered. Three span and two span continuous suspension types have been studied. These types compare in some measure with the cost of the double simple suspension with central anchorage, but are much less rigid and do not guarantee the degree of safety afforded by the central anchorage type.

However, it has been decided, tentatively, that the suspension type is desirable and further studies are being made.

A board of eminent engineers has been appointed as consultants to the Board of Public Works engineers. Mr. Ralph Modjeski is chairman and Moran and Proctor, foundation authorities, are members. It is probable that the board will be increased to include other prominent bridge engineers. All preliminary plans, studies and estimates of the department have been submitted to the consulting board and the tentative recommendations of the department have been approved, in a preliminary way, by the consultants.

All things considered, it is believed that preliminary work on the project is progressing as rapidly as possible with the limited funds available. Intensive work will begin when the larger appropriation becomes available in August.

State Road Workers Fight Blaze On Ranch; All Units to Volunteer

CALIFORNIA district highway engineers and their staffs of road workers have an enviable record for quick, thorough and efficient action in emergency.

Last month they added to their laurels by turning out as fire fighters, assisting in quelling a grain blaze which threatened to assume disastrous proportions.

Carrying out the orders of Col. Walter E. Garrison directed to Charles H. Purcell, State Engineer, the road workers throughout the

entire State have enlisted to battle this summer's fire menace. They stand ready, night or day, to assist in combating the yearly scourge of flame which takes such a devastating toll of California's wealth.

Spurred on by the proclamation of Governor James Rolph, Jr., to the citizenry of California, orders have been issued to all Department of Public Works employees to constitute themselves fire fighters in times of emergency. Already there have been results as the following letters will indicate:

LET'S HELP

May 20, 1931.

Mr. C. H. Purcell,
State Highway Engineer,
Sacramento, California.

Dear Mr. Purcell:

Governor Rolph has directed that every agency of the State be placed in cooperation with Federal and local forces engaged in the fighting of fires now raging over the entire State of California.

You will at once issue orders to all of our district highway engineers to acquaint each and every employee of this Department with the acute fire menace now existing and direct their full cooperation along these lines.

Also place all of our facilities and equipment at the disposal of fire fighting agencies.

Both Governor Rolph and myself expect the full cooperation of each and every one of the 2000 men in our employ in the field in this matter.

Very truly yours,

WALTER E. GARRISON,
Director of Public Works.

WE WILL

May 20, 1931.

To the District Engineers,
Division of Highways,
Gentlemen:

Due to the acute fire menace now confronting the State, Governor Rolph is taking an active interest in fire prevention, and has appointed Colonel Garrison as a member of a State-wide committee having as its object the prevention, suppression, and control of fires.

Colonel Garrison has requested that the Division of Highways cooperate with this committee in every way possible. We are taking this opportunity, therefore, to emphasize again the instructions contained in the 1930 Construction Department Manual and in our circular letters of April 23 and May 13 relative to fire control and burning operations.

Please make sure that your resident engineers and superintendents, as well as your entire district personnel, are fully alive to the gravity of the situation.

Yours very truly,

C. H. PURCELL,
State Highway Engineer.

AND THEY DID!

Davis, California,
May 22, 1931.

State Division of Highways, Sacramento.
Sirs:

On behalf of the West Plainfield Fire Protection District, I wish to take this means of expressing their appreciation of the help rendered by the superintendent and his men of District Ten, at a fire that burned several acres of grain on the G. W. Pierce place.

It certainly is very gratifying to the fire commissioners to know that they have such hearty support of the highway men as was shown on that day, and on their behalf wish to extend to you our many thanks.

Yours sincerely,

THOMAS W. LILLARD,
Secretary, West Plainfield
Fire Protection District.

Solemn
Warning
and an
urgent
plea to
citizens
is made
by the
Governor
in asking
cooperation
of all to

PREVENT
FIRES
this
summer.
He
tells of
grave
danger
to the
State
in his
appeal,
facsimile
of which
appears
here.

Executive Department State of California

Proclamation

To the People of the State of California:

MY FELLOW CALIFORNIANS:

I have just been informed by the State Forester's office that the thing we have been fearing for weeks has occurred—the 1931 fire season has started with outbreaks all over the State.

A genuine emergency confronts the State. Woods and fields are in powder-dry condition. The greatest drought in California history has been predicted for this year. Playgrounds and watersheds are threatened. Unless drastic steps are taken to prevent it the entire State may be afire by the middle of summer.

I am, therefore, dedicating every resource of the State Government at my command to meet this situation. The task is too great for one body such as the State Board of Forestry, or the State Forester to handle. It calls for the best efforts of every county, every civic and public body, every man, woman and child of California.

For the coordination of all State and private agencies to meet this crucial condition I am appointing a CALIFORNIA FIRE EMERGENCY COMMITTEE to consist of the following members:

Charles S. Howard, San Francisco (Chairman)
M. B. Pratt, State Forester (Executive Secretary)
Rolland A. Vandegrift, Director of Finance
Col. Walter E. Garrison, Director of Public Works
E. Raymond Cato, Superintendent, California Highway Patrol
Daniel H. Blood, Director of Natural Resources
Seth E. Howard, Adjutant General, California National Guard
Vierling Kersey, Director of Education
Avery S. Hoyt, Director of Agriculture

Jay Stevens, State Fire Marshal
I. Zellerbach, President, State Fish and Game Commission

STATE BOARD OF FORESTRY:

Swift Berry, Camano
Herbert S. Gilman, San Dimas
Ernest G. Dudley, Exeter
E. Walton Hedges, Jr., San Juan Bautista
B. A. McAllister, Piedmont
Robert C. Harrison, San Bernardino

I further wish to call upon every civic and public body in California to work with this committee, and request that similar emergency groups be formed in every county of California, with the county boards of supervisors taking the initiative.

It will be noted that this committee includes representatives of all State agencies that well might take part in this great program. The National Guard should be available in such fires as Mill Valley and Berkeley; its airplanes ready to patrol during emergency periods.

The entire California Highway Patrol will be used for establishing lines of communication on going fires, and every traffic officer instructed to enforce the law against throwing cigarette stubs or any burning material from automobiles.

Eastern tourists and visitors entering the State by automobile will be warned through the border quarantine stations of the State Department of Agriculture. Fish and game wardens will be instructed to aid forest-rangers and inspectors in every way when they are fatigued by directing fire-fighting operations.

A thorough campaign of education should be waged from now until the first rains of next fall. To this end, I am inviting the aid and suggestions of the United States Forest Service, "Stop Forest Fires" Committee, the Automobile Associations, State Chamber of Commerce, California Forest Protective Association, Los Angeles Conservation Association, American Legion, Native Sons, Service Clubs, Airplane Transportation Companies, Stage Lines and Railroads.

I have every confidence in the ability of California to meet this emergency. The first duties of the Emergency Committee will be to call it sharply to the attention of every citizen that extreme care is needed during the crucial fire period. If we can prevent fires before they are started we will be going a long way toward holding the fire loss to a low figure this year.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 19th day of May, 1931.

James R. Rogers

Governor

\$10,000,000 Work on State Highways Planned to Relieve Unemployment

APPROXIMATELY \$10,000,000 work on highways in three months!

That's the aim of the Department of Public Works—the goal to be reached by June 30th!

Hewing close to the policy of Governor Rolph that the State government bend every effort to relieve unemployment throughout the State by pushing public work as fast as engineering limitations permit, \$2,563,300 contracts have been awarded since April 29th; \$2,754,700 projects advertised; \$4,541,400 worth of work proposed for advertising by June 30th.

Col. Walter E. Garrison, Director of the Department of Public Works, announces that the highways to be constructed with this money, will cover 1013 miles.

COUNTIES TO BENEFIT

The following counties share in the contracts awarded and pending award:

Placer, Sacramento, Orange, Lassen, Modoc and Humboldt. While projects are advertised for the following: San Joaquin, Colusa, Imperial, Mono, Nevada and Ventura. Some of the more important projects follow:

In Placer County, 1.4 miles of road is to be built from Wise Power House to Auburn on the Victory Highway (Sacramento-Truckee lateral). Constructed of Portland cement concrete, this piece of highway will cost \$160,900.

IMPROVE COAST HIGHWAY

Seven and two-tenths miles of the same type of road, to cost \$216,200 will be constructed from Brighton to Mills on the Lincoln Highway (Sacramento-Placerville-Tahoe Route) in Sacramento County.

Asphalt concrete will be used in Orange County in building five and one-half miles of road on the Coast Highway from San Mateo Creek to Serra. The cost will be \$324,100.

Forty-eight miles of bituminous treated crushed rock will stretch from Hillside to Hat Creek as part of the Redding-Alturas lateral, \$278,200 being spent on this project in Lassen and Modoc counties.

A steel and reinforced concrete bridge is to span the Eel River at Dyerville in Humboldt

County as part of the Redwood Highway link. The structure will cost \$112,300.

Among the more important projects bids for which have been opened but contracts not yet awarded, are:

Seven and one-tenth miles of road from Turner Station to Stockton in San Joaquin County, part of the Valley Route. Portland cement concrete is to be used.

In Colusa County the same type of road is to be used between Williams and Maxwell on the West Side of the Pacific Highway. Eight and six-tenths miles are to be constructed.

Asphalt concrete widening over a distance of 21 miles is to be done in Imperial County from East Highline Canal to Sand Hills on the El Centro-Yuma lateral.

NEW BRIDGE PLANNED

The Bishop-Lake Tahoe road in Mono County is to be improved from Yerby's to Casa Diablo Springs with 12.3 miles of bituminous treated crushed rock.

Eight and eight-tenths miles of the same type will be constructed between Truckee and Hinton on the Victory Highway (Sacramento-Truckee Route) in Nevada County.

ARCHITECTURAL AWARDS For Month of May

AGNEWS STATE HOSPITAL—Employees' Quarters at Farm, contract for general work to A. Nelson, San Francisco, \$56,440; contract for heating and plumbing to Hateley and Hateley, Sacramento, \$17,773; contract for electrical work to Roy M. Butcher, San Jose, \$3,000.

PATTON STATE HOSPITAL—Fourteen cottages for employees, contract for general work to Fred Walsh, San Bernardino, \$21,392; contract for plumbing and heating work to Munger & Munger, Pasadena, \$7,826; contract for electrical work to Aylsworth Electric Company, Inglewood, \$898.

CALIFORNIA INSTITUTION FOR WOMEN near Techachapi—contract for general work to Wm. Rohrbacher, Santa Ana, \$124,850.

CHICO STATE TEACHERS' COLLEGE—Addition to Assembly Building, contract for general work to A. Frederick Anderson, Oakland, \$24,153; contract for plumbing and heating work to W. H. Robinson, Monterey Park, \$4,031; contract for electrical work to Roy M. Butcher, San Jose, \$1,244.

Our highways are making the people of California neighborly, and in that they are dealing a deathblow to the spirit of selfish sectionalism. The roads of California must be so built that they are both adequate for traffic needs and that they also invite and encourage the free flow of travel from every part of the State to every other part.

—GOVERNOR JAMES ROLPH, JR.



LIKE ANTS ON AN ANT HILL—Putting the finishing touches to a \$653,424 highway, the Ridge Route Alternate which will be finished next month. The construction extends over seven miles.



ACTION SPEAKS LOUDER—There's plenty here on the Galvan line change in Orange County.

Telephone System to Help Traffic

LIKE firemen, the men of the California Highway Patrol are to be on call at all times.

On orders of E. Raymond Cato, Superintendent, a telephone communication system is being planned throughout California on all State highways. The general public will be invited to use the same in cases of emergencies, thus being able quickly to secure a traffic officer.

The system primarily will be employed to enable the patrol to be in constant touch with their police work throughout the State.

And in the offing, is the possibility of establishment of a radio system for the Highway Patrol.

RADIO SYSTEM STUDIED

Mr. Cato, in his May report of departmental activities to Col. Walter E. Garrison, Director of the Department of Public Works, states that considerable time has been spent in going over the entire radio system of the San Francisco Police Department, the Boeing Aircraft System and the Department of Forestry system with a view of working out a plan of communication for the California Highway Patrol that will add to its efficiency.

Mr. Cato further reports progress in building up the equipment of the Patrol to a high point. Fourteen old automobiles were replaced and purchase of 25 new motorcycles was recommended. Permission was granted by the Department of Finance to salvage 12 Henderson motorcycles.

EQUIPMENT INSPECTED

In this connection, announcement was made of appointment of Mr. C. C. Warden to the new position of Traveling Supervisor of Equipment. He was transferred from the California Highway Commission to the Highway Patrol. The head of the bureau, accompanied by Mr. Warden, toured the southern part of the State, going down the Valley route as far as El Centro, back up the Coast route as far as Fruitvale, and into Sacramento, stopping at all counties and inspecting equipment. The outstanding county as far as appearance of both men and equipment was concerned was Riverside, and the outstanding district that of Inspector Dunean, No. 11.

Mr. Cato's report then continues:

A further decrease in the number of applications for driver's licenses was noted during the month of April, amounting to 2428 applications. The total number of applications received was 41,189.

LICENSES DECREASE

The actual number of licenses issued was less by 1820 than the total issued in April when 35,613 licenses were issued. Of these, 59 per cent were operators, 19 per cent duplicate operators and 22 per cent chauffeurs licenses. The number of chauffeurs licenses issued was less by 2628 than the figure for March.

State examiners conducted 54 per cent of the examinations, and 46 per cent were given by the auto clubs, police and other authorized agencies.

The regular quarterly inspection of the headlight adjusting stations was made in April. Practically all stations were examined and reports made, except Los Angeles County. The enforcement work for March and April shows a substantial increase over February. During the month 16 headlight adjusters were appointed and one canceled; 17 headlight stations were appointed and 22 cancelled.

BAD BRAKES ON WANE

Increased activity in the testing of brakes showed a decrease in the number of defective brakes being found.

Alterations, changes and repairs to the school conducted by the Bureau of Traffic Education at the State Fair Grounds were completed just the day before the present class came in.

The tenth class, composed of 44 men, reported to the school on April 19, 1931. Instruction has been carried on very successfully. All the students at the school have displayed a keen desire to improve themselves.

The mailing of the annual statistical pamphlet was started during the month by the Bureau of Research, Statistics and Traffic Safety. In connection therewith announcement regarding the issuance of this pamphlet in the newspapers has brought a number of requests from the general public.

Speech Explains Building Policy

Clear exposition of the highway policy of the Department of Public Works and the California Highway Commission was expressed Saturday, June 6th, at Lucerne by Col. Walter E. Garrison, Director of the Department, while speaking on behalf of Governor James Rolph, Jr., at ceremonies commemorating opening of the Ukiah-Clear Lake-Tahoe road. While Colonel Garrison's speech deals with one locality mainly, nevertheless it definitely sets forth the aims and policies of the Rolph administration in the matter of road building and maintenance, and therefore, is of singular interest to the whole State. The speech follows, in part:

DEDICATION of this, another link in the great highway system of our beloved State, has indeed been a happy occasion. Happy because it has knit more closely the people of Lake County to its neighbors, because it helps to open up this section of the State for travel, produce and trade, and because, from my point of view as Director of the Department of Public Works, it is a promise fulfilled to the people of this section.

I am happy to be here in my official capacity, and also as a private citizen. In the first place because I feel, with the California Highway Commission, a deep sense of satisfaction over a construction job well done. In the second place because I am a fellow Californian, interested as you are, in any work or achievement which advances the interests of our glorious State. * * *

The people are paying for this highway which has been opened so appropriately, just as they pay for every unit of construction and maintenance in our entire road structure. The Department of Public Works and the Highway Commission are your agents. We are striving to serve you in ratio to the money allowed us and the limits set down for us by law.

GOVERNED BY MONEY

Therefore, I beg of you when you may feel inclined to be a little impatient, to remember that there are many equities to be considered in advancing different road units throughout the State.

We would, indeed, be in hot water, were we to build roads here and there, willy-nilly.

We must and do give each proposed route or highway improvement deep and honest thought and careful reflection. And money, ladies and gentlemen, the root of all evil, governs us too—did I say “governs us”—perhaps it would be better to say “rules us” when it comes to building highways.

Which brings you and me face to face with the situation confronting roads in northern California in general and Lake County in particular. Now please rest easy—I'm not going to bore you with a mass of figures sonorously proclaimed with appropriate gestures. Rather a few pertinent ones on roads in their relation to Lucerne, Lakeport, Lake County as a whole.

SECONDARY ROADS

First: The secondary road construction fund available for the northern section of the State in the coming biennium of the eighty-third and eighty-fourth fiscal year amounts to \$1,887,000.

Second: Lake County gets \$431,454 for maintenance and construction, slightly less than one-fourth of the total. Very fair and generous, don't you think?

Three: Total expenditures on State highways in this county up until May 1, 1931, were \$2,085,933.

Four: Route 50, the Rumsey-Lower Lake road is now under construction from the junction with Route 15 (Tahoe-Ukiah) at Bear Valley to Rumsey.

Five: A number of other important secondary roads such as Pacheco Pass, Skyline Boulevard, Placerville-Tahoe, carry a large amount of traffic, and demands for their improvement are very pressing.

GO “FAST SLOWLY”

Most of these are in mountainous country and expensive to build, requiring large appropriations to effect any appreciable improvement.

Therefore, I feel you will agree with me when I state that the amount set aside for Lake County roads seems reasonable and generous, doubly so when we bear in mind that we must, perforce, go “fast slowly” with new roads in the northern section of the State since the mileage of secondary roads already totals 1778 miles to which this Legislature has just added only 171 more miles.

Egypt, Siam, Guam; 91,247 Visit State From All Nations

All the way from sunny Italy; from the lands "down under," Australia and New Zealand; the picturesque Siam; from Egypt, Haiti, Germany, Great Britain and Guam—they all come to California!

Figures given out by the Motor Vehicle Department show that a total of 91,247 non-resident permits were issued during 1930.

California's most numerous visitors were from the state of Washington; Oregon came second during the past year; Arizona next. Illinois and Michigan lead the other states from the eastern side of the Rockies. The figures follow:

Alabama	190	Missouri	2,155
Alaska	36	Montana	1,040
Arizona	6,924	Nebraska	2,105
Arkansas	455	Nevada	1,810
Australia	1	New Hampshire	94
Canada	1,870	New Jersey	1,045
China	2	New Mexico	810
Colorado	5,490	New York	3,660
Connecticut	455	New Zealand	1
Cuba	2	North Carolina	177
Delaware	42	North Dakota	500
Dist. of Columbia	400	Nova Scotia	1
Egypt	1	Ohio	3,695
England	6	Oklahoma	2,715
Florida	720	Oregon	8,885
France	6	Panama	35
Georgia	172	Pennsylvania	1,895
Germany	1	Peru	1
Great Britain	1	Philippine Islands	14
Guam	1	Porto Rico	4
Haiti	1	Rhode Island	159
Hawaii	270	San Salvadore	1
Idaho	1,690	Siam	1
Illinois	5,420	South America	3
Indiana	2,030	South Carolina	62
Iowa	2,710	South Dakota	675
Italy	1	Switzerland	2
Kansas	2,310	Tennessee	360
Kentucky	240	Texas	4,815
Louisiana	360	Utah	1,800
Maine	140	Venezuela	1
Maryland	334	Vermont	1
Massachusetts	810	Virginia	244
Mexico	57	Washington	11,120
Michigan	4,160	West Virginia	98
Minnesota	1,950	Wisconsin	1,170
Mississippi	122	Wyoming	630
Total			91,247

One thing about the good old days, if you bought a horse you could be pretty sure the model wouldn't change next month.

Helen: "I heard that Ella had eloped with Mr. Brown. Has her mother forgiven them?"

Mable: "I don't think so—she has gone to live with them."

Bring A Friend

By ROY YOUNGBLOOD,

Assistant Superintendent Highway Patrol

There are leaden men with souls of flint,
And hearts as hard as stone,
Who live for themselves throughout this life,
Live for themselves alone.

Without a thought of another's plight,
Their only thought is of self,
To crush the weak and grind them down,
In the maddened fight for wealth.

Who never see a chance to serve,
Never a chance to aid,
Never a helping hand to lend,
To some poor devil who strayed.

Ah, it's easy to feast with those who feast,
But to fast with those who fast:
To share the hunger of him who wants;
To cheer him to the last.

To shoulder his burdens; his sorrows to bear;

To help him when he's down:
With a smile each mile
On the highway of life, with never a trace of a frown.

To see the light; to forget the gloom;
To stand by him to the end;
And shoulder to shoulder to see him through,
That's being a real friend.

REVISED FORMS PUBLISHED BY HIGHWAY DEPARTMENT

The California State Highway Department has published an announcement of interest to contractors, as follows:

"Revised forms for Contractors' Statement of Experience and Financial Condition have been mailed to all contractors who are on the qualified list for plans, specifications and proposal forms for State highway work. These revised forms provide for the affidavit of accountant to be made by a certified public accountant, but, in those cases where the contractor does not desire to qualify for above \$50,000, the accountant's affidavit will not be required. Effective April 20, 1931, no names will be retained on the qualified list except those who have filed the revised form statement or whose present statement shows the financial condition as of a date now prior to December 31, 1930.

"Accompanying the statement forms will be a limited supply of forms to be used when requesting plans and specifications. On this latter form there is a provision for a supplemental statement of contracts covering the period subsequent to the date of the filed copy of the Contractor's Statement of Experience and Financial Condition. This supplemental statement will be required in all cases."

No matter how tired we get bearing that 2 and 2 make 4, still they do.

In Which Phil Stanton is Reminiscent; And Hands Out a Chuckle or Two

By PHIL A. STANTON, Highway Commissioner

SIXTY-THREE millions to be spent by the State and \$31,000,000 by counties in the coming two years on highway construction and maintenance!

I could not suppress a chuckle when I read those figures shortly after becoming a highway commissioner. They turned my mind back through the years to 1905.



Phil. A. Stanton

As a member of the Assembly in that year I was asked to introduce the County Bonding Act which would permit the counties of California to build roads outside municipalities. The automobile was just coming into vogue then and the young swain sought egress from the narrow confines of the city. He wanted to drive far afield in this new horseless buggy.

And I was asked to father the measure which would open up the highways between towns.

DIDN'T LIKE IDEA

But I was too wise! Why should they try to hand me a lemon like that to sponsor. Roads into the country! Oh, no. The thing was absurd. I handed it to my colleague and he put the measure through.

It has been a great thing for California, this highway system. It must continue to be a great thing, great in every sense of the word. Careful thought must be given to the expenditure of every penny of the people's money in the construction and maintenance of roads.

In 1909, when I was then Speaker, the Assembly voted the very first money for a State highway system. Eighteen million dollars was appropriated for road work subject to ratification of the people at the general election in 1910. This ratification was given by a majority of ONLY 12,786 votes.

STILL NOT ENOUGH

But birth was given to the gigantic system of highways which we now enjoy and we legislators went home proud that we had secured sufficient moneys to last for MANY, MANY years to come.

However, when 1915 rolled around \$15,000,000 was voted in legislation and ratified by the people at the 1916 election by a majority of 405,132 votes, not a single county voting the bonds down.

Again in 1920, \$40,000,000 was provided by constitutional amendment, a special election being held. Only 27,992 throughout the State voted no.

The Good Roads gospel had gone over with a bang.

HERE'S A PROPHECY

And now with \$63,000,000 to be spent by the State alone during the next two years, what does the future hold?

Let me quote from the bulletin of the Board of Highways in 1896, a prophecy by R. C. Irvine:

"The influence of the bicycle upon this agitation for improved highways can not be overestimated. Millions of dollars have been

(Continued on page 24.)

Analysis of New State Legislation

By A. L. BANKS, Assistant Deputy Director

PUBLIC sentiment in California has given almost constitutional force to certain policies affecting expansion of the State's great highway system.

An orderly State-wide plan affecting primary and secondary highways guides both legislation and administration. By legislation, the primary routes have been definitely selected and are being progressively improved; and in the orderly inclusion or addition of secondary roads to the system, the test of service and equity guides official action.

The late Legislature upheld these general principles both in its acceptance of plans reflected by the budget and in its measures dealing with additions to the secondary group of highways.

In conformity with a concurrent resolution of the Legislature of 1929, the State Department of Public Works, after a comprehensive survey of the existing State highway system, submitted its findings and recommendations to the Legislature of 1931. From the inevitable mass of claims of local origin, the department selected and recommended the addition of 23 secondary highways to the State system.

Three Major Points

Three major considerations determined the selection of these particular roads, namely, the large volume of inter-county or State traffic they are carrying, and, in other instances, the relief they will bring to other over-taxed primary roads, and also their service as important links in interstate traffic.

Governor James Rolph, Jr., Col. Walter E. Garrison and the State Highway Commission gave united support to the legislation effectuating the Department's recommendations. The Legislature decisively endorsed the administration's stand. The Edwards (Senate) and Kline (Assembly) bills, companion measures, were promptly passed and as promptly signed by the Governor.

These new acts are: Senate Bill No. 46, (Chapter 82, Statutes 1931)—Senators

Edwards, Breed, Allen, Baker, Cassidy, Duval, Harper, McCormack, McKinley, Riley, Sharkey, Swing and Waggy, authors; and Assembly Bill No. 7 (Chapter 96, Statutes 1931)—Assemblyman Kline, author.

These measures are identical in language, authorizing and directing the Department of Public Works to lay out and construct as secondary State highways the following 23 highways:

(a) Alturas to Oregon State line near New Pine Creek.

(b) Quincy to State Highway Route 29, near Chats.

(c) Vallejo to State Highway Route 8.

(d) Walnut Creek to Oakland.

(e) Weed to California-Oregon State line near Calor.

(f) Bishop to California-Nevada State line (Montgomery Pass).

(g) Bakersfield to Mojave.

(h) Red Box Divide to Pine Flats (Route 61 to Route 62).

(i) State Highway Route 26 near Colton via Pomona to Los Angeles.

(j) State Highway Route 43, Waterman Canyon via Santa Ana Canyon to Newport Beach.

(k) Beaumont to Riverside (Jackrabbit Trail).

(l) Riverside to San Diego (Inland route).

(m) Pomona to Temecula.

(n) Blythe to California-Arizona State line at the Colorado River and State Highway Route 64 to State Highway Route 26, near Indio.

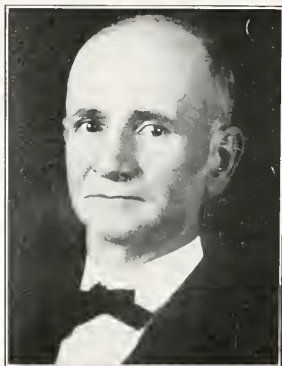
(o) National City to International boundary line near Tia Juana.

(p) El Centro to Calexico.

(q) Oasis to California-Nevada State line.

(r) State Highway Route 2 near Ventura to State Highway Route 4 at Castaic Junction.

(s) From State Highway Route 31 near Cajon Pass to State Highway Route 23 near Lancaster.



A. L. Banks

Relation of Laws to Highway Work

(t) Pomona to Fullerton via Brea Canyon.

(u) Cambria to San Luis Obispo.

(v) Santa Barbara to State Highway Route 2 at Zaca via San Marcos Pass.

(w) State Highway Route 14 near Crockett to American Canyon route near Vallejo.

To Continue the Study

After the foregoing legislation was passed, the 1931 Legislature, upon the recommendation of the Department of Public Works, adopted Senate Concurrent Resolution No. 10 (Chapter 58, Statutes 1931), Senators Slater and McCormack, authors. This resolution provides for a study and report by the Department of Public Works, to be ready for the 1933 Legislature, recommending another orderly addition of new roads to the secondary State highway system.

The requirements of the resolution are:

Additions recommended shall total not more than 15 per cent of the secondary State highway mileage as constituted by the Breed State Highway Classification Act of 1927, said mileage to be added in the ratio of not less than three nor more than four miles in the south to one mile in the north. The study is to be of routes, which by reason of the large volume of State traffic they are carrying, or by reason of the relief they would afford to heavy traffic upon present State highways, or as highways serving as important State links, should be added to the State system.

Basis for Inclusion

Senate Concurrent Resolution No. 18 (Chapter 50, Statutes 1931), Senator Ingels, author, is a "rider" on the resolution just summarized. It provides: "That the California Highway Commission and the State Department of Public Works when planning, constructing or improving the State highway system, shall give due consideration and regard to the development of the natural resources of the State and the improvement of agricultural marketing facilities as well as traffic needs."

Important Bridge Legislation

Bridge legislation, dealing with one of the highest phases of the State's development, received attention that will make history. The last Legislature was most friendly and

responsive to all bills prepared and submitted by the Department of Public Works for the purpose of facilitating the construction of the gigantic San Francisco Bay Bridge, which is to cross from San Francisco via Goat Island to Oakland. These bills were passed practically without dissenting votes. Legislators from every section of the State broadmindedly united in the promotion of this project.

The trio of bills which were designed to hasten the construction of the great bridge are:

The San Francisco Bridge

Senate Bill No. 337 (Chapter 400, Statutes 1931), Senators Fellom, Tubbs, Maloney, Breed, Jones, Young, Crittenden, Sharkey, Inman and McCormack, authors.

This act appropriates the sum of \$650,000 for the survey, plans, estimates, preliminary engineering and other preliminary expenses for the new San Francisco Bay Bridge to be expended through and upon authorization of the Department of Public Works. This appropriation is in effect a "loan," as the California Toll Bridge Authority is directed to return this appropriation to the State General Fund out of the proceeds of the first sale of revenue bonds issued for the construction of the bridge, with interest thereon at the rate of 4 per cent per annum.

Bridge in Highway System

Senate Bill No. 336 (Chapter 399, Statutes 1931), Senators Fellom and Breed, authors, gives discretionary authority to the Department of Public Works when the San Francisco Bay Bridge is *completed*, to make it a part of the State highway system *for maintenance purposes only*.

Revenue Bonds Validated

Senate Bill No. 460 (Chapter 401, Statutes 1931), Senator Fellom, author.

This act provides for certain technical amendments to the California Toll Bridge Authority Act of 1929 which will make the revenue bonds, issuable thereunder for the acquisition or construction of toll bridges, more readily marketable.

The Bridge Memorial

While the measure, which has since become a law, granting a permit for the construction

(Continued on page 20.)

Two Manuals Prepared For Guidance in Work Of Highway Employees

Manuals of Instruction, of intense interest to contractors, have just been issued by the Department of Public Works. One is from the Construction Department, the other prepared by the Department of Surveys and Plans.

The manuals are the guide and authority to be consulted on all features of work performed under the jurisdiction of the department and not properly pertaining to specifications.

C. S. Pope, construction engineer, in a message to the employees of the Division of Highways, says:

"These instructions are founded on experience, common sense and precedent and, in general, are the result of years of analytical thought and study on the part of many different engineers of the Division of Highways who have sought to improve construction methods and standardize the attitude of the department in many matters of public policy."

YOU CAN'T AFFORD TO OVERLOOK THIS!

AUTOMOBILE OWNERS—Who pays your insurance bill? You do, of course. But who is responsible for the increase in your rates? *You are*, if you are careless. Reduction in accidents will mean a reduction in rates.

FATHERS—The protection of your loved ones is your paramount aim. Your family does not bear a charmed life—careless actions may rob you of your dearest possession. While you are busy working for the betterment of yourself and family, others are working for their protection.

MOTHERS—The guidance and protection of your little ones is your life. An agency working for their protection is more than deserving of your active support.

TO ALL—Fifty thousand five hundred persons were killed during the time the United States was in the World War. Fifty thousand nine hundred persons were killed by automobiles during the last 18 months in the United States. This slaughter **MUST CEASE**. It is a challenge to you—will **YOU** accept it?

—From The Berkeley (Cal.) Traffic Safety Commission.

WHEN A FELLER NEEDS A FRIEND AND FINDS A FLOCK OF 'EM

When one has been accustomed to assist in sending to press a daily newspaper and then jumps into the task of preparing a monthly official bulletin, then's when he needs a friend.

And so I can not thank too much my predecessor, Mr. George Mansfield, and State Printer Harry Hammond's fine aides who have so generously and willingly assisted in this, my first publication. I refer particularly to James F. Lyon, Harry Orman, Bert Taylor and Dan Sullivan.

Many thanks.

E. C.

FOREST FIRES

(Continued from page 1.)

Governor Rolph's proclamation requests the county governments within the State to cooperate through county fire emergency committees appointed by the boards of supervisors.

With the State and the county governments organized against fire, the Governor believes a thorough campaign of education should be waged. To this end, he has invited the following agencies, well known throughout the State for their active programs each summer in fire prevention work, to assist the State: United States Forest Service; "Stop Forest Fires" Committee; the Automobile Associations; State Chamber of Commerce; California Forest Protective Association; Los Angeles Conservation Association; American Legion; Native Sons; Service Clubs; Airplane Transportation Companies; State Lines and Railroads.

Governor Rolph is the first Governor since the days of Governor Arrillaga in Spanish rule of California to issue a proclamation to his subjects to assist in stopping losses from fire in the natural wealth of the State.

In 1793, based on the reports of the missionaries traveling El Camino Real of the losses to forests and pastures from fire, Governor Arrillaga promulgated a proclamation calling upon the parishes to conduct an educational campaign among the Christian and Pagan Indians against fire.

The press representatives in Sacramento as covered by the United Press, the Associated Press and the metropolitan dailies of the State have organized and placed their services at the disposal of State Forester Pratt in conducting the campaign laid out by Governor Rolph.

Highway Commission Inspect Kings River Canyon Road Project

AT the invitation of the Fresno County Chamber of Commerce, the entire State Highway Commission and State Highway Engineer C. H. Purcell, met in Fresno at a dinner and conference on the evening of May 28th.

The announced purpose of the meeting was to discuss the Kings River Canyon Highway project which is now under construction beyond General Grant Park with convict labor.

Mr. Chester H. Warlow very ably presented statistics and data concerning the project, after which motion pictures were displayed, indicating something of the grandeur of the Kings River Canyon, together with some of the construction operations now under way beyond General Grant Park.

PARTY INSPECTS CAMP

Each of the commissioners was presented with a very attractive folio containing several large photographs of the Kings River Canyon and adjacent territory.

On the following day the commissioners, accompanied by approximately 25 members of the Fresno County Chamber of Commerce, visited Camp 19 and inspected the eight miles of completed highway, together with the construction operations which are now approaching the junction of the Middle and South Fork of the Kings River.

PLEASED WITH PROJECT

The commissioners expressed themselves as being very much pleased with the entire project.

After luncheon, which was served by the convicts, all the commissioners returned to their homes except Commissioner Hopkins, who continued on a trip into the canyon by horseback, accompanied by Mr. Warlow and a number of other members of the Chamber of Commerce.

Mr. Hopkins was much impressed by the attractiveness and magnitude of the Kings River Canyon country.

Carelessness Chief Cause of Grade- Crossing Accidents

THE following figures of grade-crossing accidents in 1930 compiled by the State Railroad Commission indicate that the great bulk of grade-crossing accidents are "avoidable."

Struck by head-end of train, 1215 accidents;
Struck by rear-end of train, 85 accidents;
Ran into standing train, 91 accidents;
Ran into moving train, 642 accidents;
Vehicles struck flagman, 5 accidents;
Vehicle ran through lowered crossing gates, 300 accidents;
Vehicle struck fixed objects, 54 accidents.
Other causes, 63 accidents.

Cloudy, foggy, or rainy weather did not result in producing more accidents than clear weather, the record showing 1379 accidents in clear weather in daylight, as against 57 in dusk, and 677 in the dark. Cloudy weather showed 95 accidents during the daylight, four during dusk, and 54 in the dark. Foggy weather evidently merely increased the caution of drivers as there were but 66 accidents during fog conditions, and 123 during rainy weather.

The fact that 1746 grade-crossing accidents occurred at crossings where the view was unobstructed would appear to emphasize the need for greater caution on the part of drivers. There were 658 accidents at crossings where the view was impaired, due to other causes than cars standing on adjacent tracks, and only 51 accidents at crossings where the view was impaired by cars standing on adjacent tracks.

The record shows that the larger the number of occupants of the vehicle the smaller the number of accidents occurred. For instance, there were 1680 accidents involving highway vehicles containing but one person, while there were 444 accidents involving two occupants, 150 involving three occupants, 86 involving four occupants, 39 involving five occupants, 14 with six occupants, three with seven occupants, and one with eight occupants, during 1930.

ROADSIDE BEAUTY COUNCIL

More than a hundred Santa Barbara and Montecito citizens have decided to form a County Council for the Preservation of Roadside Beauty for Santa Barbara County.

The fellow who does what must be done works for the fellow who does what ought to be done.

"Every man has his price."

"Yes, and every woman her figure."—*Exchange*.

The Old Philosopher says marriage is just like a railroad sign: when you see a pretty girl you stop, then you look, and after you're married you listen.—*Twin Twinkles*.

Legislature Makes Many Changes In Laws Governing Automobiles

By MARSHALL A. PAGE, Chief Clerk, Division of Motor Vehicles

THE 1931 Legislature made numerous changes in the vehicle laws of California, many of which are of vital interest to the motorist.

Practically every phase concerning the ownership, registration and operation of a motor vehicle is affected by this legislation. Many sections of the present act are rewritten entirely to clear up ambiguities and to make the enforcement of the law less cumbersome.

These changes were embodied in Senate Bill 548 by Senator A. H. Breed and Assembly Bill 785 by Assemblyman W. B. Hornblower.

The Breed bill embodied the principal changes, being a redraft of the present vehicle act aimed to improve the existing act and make the highways safer, while the Hornblower bill divorces the Division of Motor Vehicles and the California Highway Patrol from the Department of Public Works and sets them up as a part of an independent department of the State government with a director in charge who shall be a member of the Governor's Cabinet.

Both these bills have been signed by Governor James Rolph, Jr., and will become effective in August.

Outstanding in public interest are the maximum speed limit changes in the Breed bill which raise the limit on the open road from 40 to 45 miles per hour; in residential districts from 20 to 25 miles per hour and in business districts from 15 to 20 miles an hour.

The present limit of 15 miles in school zones, at blind intersections, grade crossings and around curves remains unchanged.

Motorists should note carefully that the increased speeds are permissible only when conditions permit such speeds with safety.

To a degree, the new maximum limits are the results of a compromise as a very determined effort was made in the Legislature to remove speed restrictions entirely. This move

was opposed by officials of both the patrol and the division.

A new section is added making it unlawful to drive at a speed so slow that the reasonable flow of traffic is retarded. Traffic officers are given authority to enforce this provision. This is the first legislative recognition of the fact that it may be as dangerous to drive slowly under some conditions as to drive too fast.

The Legislature also recognized the fact that many cars may be operating along the highways in an unsafe condition. New provisions make it unlawful to operate such a vehicle and give traffic officers the authority to stop any car suspected of being mechanically unsafe.

Enumerated below are other important changes in the law:

Definition of semitrailer amended to permit such vehicle to have more than one axle and two wheels.

Motorcycles are included as emergency vehicles when publicly or privately owned if used by a peace officer, forest ranger or fire warden.

Division of Motor Vehicles required to furnish synopsis of California driving regulations with each registration.

Serial numbers and number of cylinders required on application for registration in addition to present data.

Provides that the Department of Public Works may issue a permit for the operation of a vehicle subject to registration when the operation is only for the purpose of crossing any highway from one property to another.

Requires that certificates of registration and ownership for out of state cars be of a different color than those issued for resident cars.

Plates must be installed at least 16 inches from the ground instead of 24.

Requires the seller as well as buyer to notify Division of Motor Vehicles of sale or transfer of his interest in a vehicle.

Nonresident cars are permitted to operate on nonresident plates as long as such plates



Marshall A. Page

Slow Driver Must Keep to Right or Receive a Ticket

are good in the state in which it registered. The present law requires a nonresident to secure a California license after he stays six consecutive months in the State.

Garage keepers required to report to police when they receive cars showing evidence of having been struck by bullets.

Division must revoke the license of a minor upon death of parent or guardian who signed application for such license.

Minimum age of person to whom license may be issued fixed at 16 instead of 14 years except upon special request of parent or guardian.

Licenses of minors under 18 twice convicted within six months for speeding, reckless driving or driving while intoxicated must be revoked by division after notification by court.

Division permitted to impose restrictions on licenses issued to physically handicapped persons.

Licenses of persons convicted of driving while intoxicated or hit and run shall be suspended unless and until they are able to give proof of financial responsibility by furnishing cash bonds, real estate or by proper insurance.

Provides a new schedule of stopping distances for commercial vehicles other than those carrying passengers.

Restricts the use of siren by officers when serving as escorts to processions.

Prohibits the operation of vehicles from which matter, other than clear water, is leaking or sifting.

Requires two red lights instead of one be placed on the rear of projecting loads.

Unlawful to display signs using terms "State Division of Motor Vehicles," or "Motor Vehicle Department."

Excessive speed not regarded as negligence in civil suits unless the plaintiff in such suits is able to establish that such driving constituted negligence.

Unlawful to maintain glaring or dazzling lights along the highway.

Business and residence districts must be posted with signs showing the legal speed limits.

AUTOISTS! ATTENTION!!

Some important points for the motorist to remember about the new California Vehicle Act are as follows:

Speed limits are raised five miles an hour but only when conditions permit such speeds with safety.

It will be unlawful to drive at a speed so slow as to retard the reasonable flow of traffic.

It will be unlawful to crowd so many persons into the front seat that the driver's view is obstructed.

No vehicle mechanically unsafe may be driven and officers have the right to stop any vehicle and examine it. Pedestrians have the right of way at cross walks.

It will be legal to pass a vehicle moving in the same direction, on the right on roads where there are two or more parallel traffic lanes running in each direction.

Drivers descending grades on one-way roads must back up to permit ascending cars to pass.

Minimum age for issuance of an operator's license raised from 14 to 16 years with provisions for issuance to minors between 14 and 16 by special application of parent or guardian.

Driver of vehicle descending grade required to back up to a place where vehicle coming up grade may pass.

Pedestrians given the right of way at cross walks.

Vehicles carrying explosives or inflammables must display signs.

Division authorized to conduct complete investigations and research concerning the cause of motor vehicle accidents.

Uniform Directional Signs Are Favored for Highway Installation

IN response to many questions from communities all over California, asking permission to erect directional signs, State Highway Engineer C. H. Purcell has prepared the following statement:

I would advise that signs can be installed on State highway rights of way only under permits issued by the Division of Highways. We endeavor to follow a single standard in making installations of warning and directional signs.

We do not favor the installation of special types of signs, as we feel that the advantage of all warning and directional sign service is in its uniformity and simplicity. The Division of Highways, of course, has no jurisdiction over the county roads in regard to this matter.

Did you know that Californians apparently would "rather ride than eat"? At least that is indicated in figures recently released by the United States Department of Commerce. It is noted that while the State's population spends 20.29 per cent of its income for food, it spends 23.56 per cent of its money for automobile purchases.

Survey of Toll Bridge Is Ordered

(Continued from page 15.)

of the San Francisco Bay Bridge, was pending in Congress, the Legislature, in January of this year, adopted Senate Joint Resolution No. 7 (Chapter 17, Statutes 1931), Senator Fellom, author. This resolution memorialized Congress to pass such enabling congressional consent to the building of the bridge across San Francisco Bay.

Toll Bridge Policy Declared

Looking forward to a possible purchase of the great Carquinez Straits Bridge (built some years ago as a privately owned toll bridge) through the medium of revenue bonds, the 1931 Legislature adopted Senate Concurrent Resolution No. 36 (Chapter 78, Statutes 1931), Senator Fellom, author. The California Toll Bridge Authority is authorized thereunder to conduct a survey and investigation of said toll bridge with a view to the acquisition thereof by the State and report thereon at the next session of the Legislature.

Ehrenburg Bridge Purchase

The Colorado River Bridge near Blythe, Riverside County, California, and Ehrenburg, Arizona, is dealt with by Senate Bill No. 530 (Chapter 149, Statutes 1931), Senator Edwards, author.

While the bridges heretofore mentioned are located in northern California, southern California had a toll bridge problem of interest to itself as well as to the remainder of the State. A privately owned toll bridge is now being operated across the Colorado River, near Blythe, California, commonly called the *Ehrenburg Bridge*. The highway departments of the states of Arizona and California had been conducting negotiations for the possible joint purchase of this bridge and making it a free interstate bridge, thereby releasing a large amount of Federal aid road moneys which otherwise would not be relinquished by the Federal Government if this bridge remained a privately owned toll bridge.

Governors Hunt and Rolph, of Arizona and California, respectively, interested themselves in the matter, and as a result of several friendly exchanges, the Legislatures of the two states passed urgency enabling acts authorizing the purchase of this property and throwing it open to the public as a free bridge. The purchase of the bridge is

expected to be consummated in the very near future and the burden of paying tolls at this State entrance removed from interstate traffic forever.

Motor Vehicle Department

Assembly Bill No. 785 (Chapter 478, Statutes 1931), Assemblyman Hornblower, author, was the only act making any important change in the organization structure of the Department of Motor Vehicles. This act removes the Division of Motor Vehicles from this department and creates a new State department to be known as the Department of Motor Vehicles. This new department will consist of the Division of Registration and the Division of Enforcement, to be known as California Patrol.

Advertising Public Work

Some change was made by Assembly Bill No. 1202 (Chapter 831, Statutes 1931), Assemblyman Easley, author, in the procedure for advertising public work. The bill amends the present State Contract Law as requested by the State Department of Public Works, providing that notice of any work to be done by contract under the direction of the State Department of Public Works shall be published once a week for AT LEAST TWO CONSECUTIVE WEEKS, instead of the inflexible period of once a week for three consecutive weeks as in the present law.

On large contracts, the Department of Public Works expects to continue the three weeks' advertisement, but in the case of urgency jobs to handle unemployment situations or readvertisement of jobs, the department will be in a position to advertise for two consecutive weeks.

Moreover, on large projects, the department desires the privilege of advertising for more than three consecutive weeks. A longer period of notice may be deemed expedient. This also has been provided for.

Interdepartment Work

Interdepartmental service charges are provided for in Assembly Bill No. 1167, Assemblyman Nielsen, author.

This act permits the Department of Public Works to do work for other State departments in its highway shop located at Sacramento

Workingman Protected by Two Bills

(Continued from preceding page.)

and in its several other shops operated by the department in various sections of the State, such work to be paid for from the funds of such other State departments.

Two Labor Regulations

Two new labor acts of interest to State highway contractors were passed by the 1931 Legislature and signed by the Governor. The first of these is Senate Bill No. 26 (Chapter 397, Statutes 1931), Senator Inman, author.

The title of this act explains itself. "An act to provide for the payment of not less than the general prevailing rate of wages on public works, and not less than the general prevailing rate of wages for legal holiday and overtime work on public works, providing for the ascertainment of such general prevailing rate by the public body awarding the contract and its insertion in the contract and the call for bids for the contract, providing for the keeping of records by the proper public officials, providing for a forfeiture for each calendar day, or portion thereof, any worker is paid less than the said rate and for a stipulation to this effect in the contract, and providing other penalties for violation of the provisions thereof."

Joint Highway Procedure

The "Alien Labor Law," or Senate Bill No. 83 becomes Chapter 398, Statutes 1931. Senator Maloney was the author.

This act prohibits the employment of aliens by contractors and subcontractors on all public work in California, except in certain specified cases of extraordinary emergency. The term "alien" is used in the act to mean any person who is not a born or fully naturalized citizen of the United States. Penalties for violations of the act are provided.

A new Joint Highway Act, set up in Senate Bill No. 578, becomes Chapter 1025, Statutes 1931. Senator Fellom was the author.

This act radically amends the present joint highway procedure. The act provides that all existing joint highway districts may continue to function under present procedure, or may elect to reorganize and come within the provisions of the new act.

Cooperative Highway Law

Assemblyman Biggar's Cooperative Highway Bill is now Chapter 463, Statutes 1931.

This act provides for cooperative construction or improvement of highways by the State and counties. It applies only to the improvement of an existent highway or the construction of a proposed highway in a county, supplying an extension of a forest highway system road or national park road *already built or under construction*, to connect with any highway which forms a part of the State highway system of California, provided that such connecting road shall not exceed 50 miles in length.

To Care for Markers

Assembly Bill No. 170 (Chapter 170, Statutes 1931) by Assemblyman West authorizes the California Highway Commission to keep in repair and to erect signs and markers upon or adjacent to State highways indicating landmarks of historical interest.

Discretionary, in Street Work

The claims of cities to street improvements for connecting highways, and the discretionary authority of the Highway Commission are set forth in Senate Bill No. 810 (Chapter 807, Statutes 1931) by Senator Breed.

This is an act reaffirming the authority of the Department of Public Works, *in its discretion*, to take over and construct links of State highway within municipalities. It also empowers the department to acquire rights of way for such purpose by purchase, condemnation or donation within municipal limits.

Grade Crossing Problem Study

The grade crossing problem received attention by Assembly Concurrent Resolution No. 23. It becomes Chapter 45, Statutes 1931. Assemblymen Biggar and Jones are joint authors.

This resolution directs the Department of Public Works and the Railroad Commission of the State of California to make a joint and complete study of the matter of grade crossings within this State and report their findings and recommendations to the 1933 Legislature.

Highway Beautification

Highway beautification is proposed by Assembly Concurrent Resolution No. 34 (Chapter 85, Statutes 1931). Assemblywoman Eleanor Miller, Assemblymen Biggar, Clouds-

(Continued on page 24.)

State Teachers College at San Jose

First to Get Modern Gymnasium

By RODERICK MILES, Architectural Designer.

THE San Jose State Teachers College is to be the first of California's normal schools to have complete gymnasium facilities for athletic training when they take occupancy, this fall, of the new men's gymnasium.

The justification of this building is by no means of recent birth, for "San Jose" has enjoyed for years the largest enrollment and the greatest number of men student-teachers in the State. Even at the time of construction of the women's gymnasium four years past the need was felt. But as the junior college and four-year courses were added, attracting a greater enrollment percentage of men, this need moved into the acutely imperative class. The remedy was not another building of limited purpose, such as the women's physical instruction program necessitated, but a structure with the potential ability to serve the entire school organization efficiently and completely by satisfactory answers to each item of a list of heterogeneous requirements demanded by existing conditions. The Division of Architecture accomplished these answers by the inclusion of features and arrangements in a plan to give an altogether multi-purpose design.

On the first consideration of the planning problem it was evident that because of the three major classifications of activities the building would take the form of three units so arranged as to be used either independently or conjointly.

The central unit contains the main gymnasium floor, 72 feet wide by 102 feet long, which makes possible a maximum size basketball court for intercollegiate matches or two minimum courts running across the width for practice, and is ample for athletic exercise classes of more than 150 students at one time. This is surrounded by bleacher type seats accommodating more than 1700 persons and along the sides are 300 more seats that can be

let out of the walls to floor level, raising the total audience to more than 2000. The arena is completed by a vaulted roof supported on steel trusses with 120 feet span that clear the playing floor 30 feet. There are four stair towers so planned that one or all may be used as entrances, and with the addition of four stairways from seat space to main floor, total eight exits. While the towers are circular the stairs are designed in straight runs with right angle turns at landings, but no corners or wall set backs which eliminate all possibility of congestion in case of panic.

The ground floor is three feet below the gymnasium floor and are those portions of the central unit covered by the arena seats.

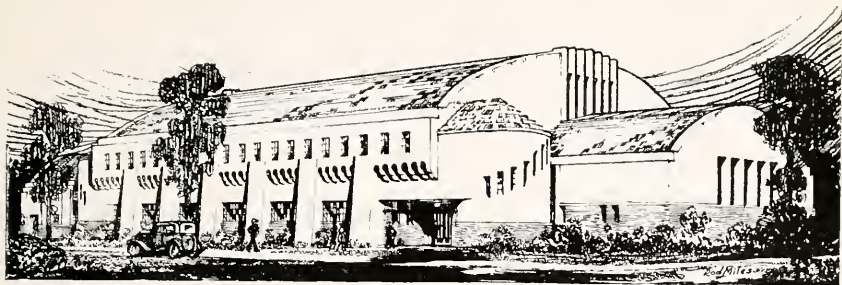


Roderick Miles

These areas are occupied by the main men's dressing room which is equipped with lockers, shower, toilet, towel and first aid rooms and is directly connected to two of the lobbies, which in turn give into the main gymnasium floor. One of these lobbies also connects the men's dressing room with the foot bath which all swimmers must pass through to reach the pool. On the opposite side of the building, under the seat space, will be found two more lobbies, one of which connects the main gymnasium floor with the boxing and wrestling room.

This room is equipped and designed to be used as a team clubroom, and also by visiting basketball teams. A passage gives from one end of this room to the director's, secretary's, instructors' offices and to a fourth lobby, which in turn is connected to one of the aforementioned lobbies by a wide corridor that is on the same level with the main gymnasium floor and connects it to the apparatus gymnasium, which we will call the south unit of the building.

This south unit houses one large room 40 by 60 feet for instruction in the use of gymnasium apparatus and corrective physical exercises. The walls and floor are marked off



SOUND BODIES, SOUND MINDS—The thought behind construction of this attractive and serviceable gymnasium for the San Jose State Teachers College. This is a drawing of the exterior of the building which is 260 feet long.

into handball courts, et cetera. A room of ample size for the storage of apparatus not in use is provided at one end, and at the other end a pantry kitchen to provide refreshments when this gymnasium is being used for entertainment or at such times that the main gymnasium is being used for a pageant or ball.

The north unit is the natatorium with a swimming pool 35 feet wide by 70 feet long, making possible a 50-yard dash for six swimmers, by once doubling the length, which is the shortest dash now recognized in official intercollegiate meets. The pool is lined with light colored tile with lane and depth markers of a complementary color. A five-foot walk way borders the sides and the shallow end of pool, while at the deep end there is an area 14 feet wide giving the swimmers a chance for running dives and play space. Spectator seats are provided the full length of both sides of the pool, seating an audience of more than 450 persons. Under one tier of seats is the women's dressing room to be used by swimming classes only. It has the usual equipment of individual dressing stalls and showers, a towel room, hair dryer, etc. The only entrance is from the exterior directly, and its only access to the pool is through the foot bath.

The mechanical equipment of the pool, filters, sterilizer and pumps is taken care of in the space under the tier of seats on the opposite side. Then there is a small heater room for a water heater and storage tank.

Each unit of the building is heated separately by steam with individual controlled heaters which either provide fresh air or heat the air in the room by recirculation.



GROUND FLOOR PLAN

MUCH IN LITTLE—Everything, even the kitchen stove, seems to be provided in this new gymnasium.

Beautification of Highways Urged in Assembly Measure

(Continued from page 21)

ley, Kline, Head, Snyder, Easley, Quigley, Reid, Crowley, Greene, McDaniel, Patterson and Craig share in the authorship.

This resolution directs the Division of Highways of the Department of Public Works and the Division of Parks of the Department of Natural Resources to formulate a coordinated State-wide plan of highway beautification and report back to the 1933 Legislature.

These acts constitute the major results of late legislation affecting the Division of Highways. There are others of importance relating to the Water Resources Division deserving of a special review later.

ROAD PROBLEMS OF OTHER DAYS TOLD BY MR. STANTON

(Continued from page 13.)

invested in the manufacture of these easy and graceful machines of locomotion and this agitation for better roads is due more directly to the efforts of the wheelmen than to any other cause.

FORTY MILES A DAY

"Any machine which enables a man to travel with pleasure, without discomfort and practically without expense, 40 miles a day, is evidently one which has come to stay and the number of wheelmen will surely reach extraordinary proportions in the years to come."

I am not a prophet. The figures I've quoted in this article; the determination of Californians to open up every section of their State to travel and trade—these things make me fight shy of prophecy in this year of 1931.

You try.

GOLD FOR ROADS

Approximately \$1,500,000,000 is being spent for road-building in the forty-eight states during the current year on a program which calls for the improvement of around 60,000 miles of new highways, according to a report submitted to the twenty-ninth Annual Convention of the American Automobile Association held this month at West Baden, Indiana.

The report, based on a survey made by the A. A. A. National Good Roads Committee, showed that thirty-five states have enlarged their 1931 road programs, as compared with 1930, from both the standpoint of expenditures and mileage to be improved.

9 Patrol Officers Cited for Work; 10 Others Win Praise

NINE members of the California Highway Patrol were cited this month for services of an especially meritorious nature performed during May.

Ten others received honorable mention because their activity during the month resulted in the capture of 12 persons convicted of stealing automobiles.

Outstanding among commendatory acts was that of Officer J. N. Nobel of Ventura County who saved the life of a girl who had been carried out to sea, by giving her first aid and artificial respiration.

Officer Walter M. Walsh of Imperial County was commended for giving first aid and setting the broken arm of a person injured in an automobile accident.

Officer J. L. Randolph of Mendocino County was commended for taking to a physician a boy who had been shot.

Capt. E. J. Johnstone was cited for the arrest of a man wanted by the sheriff of his county on a felony warrant. It was necessary to disarm the man before he could be taken into custody.

Charles Golden and James Olsen, border checkers of Humboldt County, received mention because they removed a fallen tree from the highway. The work was done after midnight because the men were unable to locate members of the highway crew at that hour.

I. D. Christie, border checker of the same county, was commended for assisting a woman whose ankle had been sprained.

Officer Elmer King of Solano County was commended for the capture of a bad check passer wanted by the police, and Capt. G. B. Daley of Siskiyou County was commended for his cooperation after a burglary and shooting affray.

The officers given favorable mention for the capture of automobile thieves included Officers C. R. Avellar and H. T. Hendricks of Alameda County; Officers Harold McCoy and Dan Rentle of Ventura County; Capt. Fred J. Bly and Officer Sam Kirkpatrick of Humboldt County and Officer E. W. Crane of Santa Barbara County.

We are told that "this year's world output of motor cars will run into millions." We are glad of this hint, and shall try our best not to be one of those millions.

California Water Shortage Grave; Steps are Taken to Prevent Waste

By HARLOWE M. STAFFORD, Sacramento-San Joaquin Water Supervisor

IN the April and May issues of this Journal the water situation facing the State this season has been touched upon in the report of information as published in the monthly bulletins of Snow Survey and Precipitation Data of the Division of Water Resources.

Based upon the snow surveys at the end of March (beginning of the melting period) at some 160 snow courses throughout the major stream basins, and upon all available precipitation data to April 1st an estimate was made of the seasonal run-off in per cent of normal for each basin. Realization of the estimates was contingent to some extent of course upon the precipitation to occur subsequently to April 1st. At the end of May further snow surveys were made at "key courses" to show the extent of melting and the data thus derived together with the fact that another month of subnormal precipitation had gone by warranted a downward modification of the earlier run-off estimates.

FIGURES COMPARED

As estimated early in May, the 1931 seasonal stream flow in per cent of normal (mean of 40-year period, 1889-1929) is shown in the following tabulation which also shows the actual seasonal stream flow in per cent of normal for 1924, the previous driest year of record.

Stream	Seasonal stream flow in per cent of 40-year mean (1889-1929)	
	Estimated Actual	1931 1924
Sacramento River at Red Bluff	34	36
Feather River at Oroville	26	25
Yuba River at Smartsville	34	23
American River at Fair Oaks	27	18
Sacramento River at Sacramento (including tributaries)	30	30
Mokelumne River at Clements	36	22
Stanislaus River at Knights Ferry	32	19
Tuolumne River at Jacksonville	36	28
Merced River at Exchequer	34	23
San Joaquin River at Friant	26	22
San Joaquin River near Vernalis (including tributaries)	32	24
Combined Sacramento and San Joaquin Rivers (including tributaries)	30	28
Kings River at Piedra	24	21
Kaweah River at Three Rivers	26	23
Kern River near Bakersfield	30	28
Combined Kings, Kaweah and Kern Rivers	26	23

In the Sacramento Valley, next to the estimate of seasonal run-off, the rice acreage is the major factor to be taken into consideration in endeavoring to forecast what minimum stream flow is to be expected at lower river points. In the early April estimates preliminary data indicated an increase in the rice acreage of about 10 per cent over that of 1930, and based upon this assumption, certain minimum flows were predicted as well as the approximate degree of salinity to be expected at various points in the Sacramento-San Joaquin Delta due to the insufficiency of fresh water inflow to prevent the encroachment of salt water from San Francisco Bay.

By early May, however, an actual check of the rice under diversions from the Sacramento River and tributaries indicated considerably greater than 10 per

cent increase over 1930, and accordingly, the estimates of minimum flow and salinity were revised as shown in the following tabulations which give also the corresponding actual data for 1924.

Stream	Minimum flow in second-feet		Date
	Estimated 1931	Actual 1924	
Sacramento River at Red Bluff	2800	2810	July 6
Sacramento River at Colusa	900	1470	July 21
Sacramento River at Sacramento	800	705	July 17
Feather River at Nicolaus	50	0	Aug. 2
American River at Sacramento	30	0	Aug. 1
San Joaquin River near Vernalis	450	391	July 22
Combined Sacramento and San Joaquin River flow to Delta, minimum 10-day flow	1300	1280	July 10 to 19 incl.

Maximum salinity (high tide) in parts of chlorine per 100,000 parts of water

Delta stations	Estimated Actual 1931		Date
	1931	Salinity	
Oakland and Antioch Ferry	1350	1345	Aug. 28
Collinsville	1150	1150	Aug. 16
Antioch	1050	1080	Aug. 20
Emmaton	750	802	Aug. 6
Jersey	650	708	Aug. 30
Three Mile Slough Bridge	600	692	Aug. 30
Rio Vista	550	608	Aug. 12

These data indicate conditions for the 1931 season practically the same if not more serious than were those of 1924.

In the latter year it will be recalled that some 200 water users from all parts of the valley met in Sacramento late in January at the first Sacramento-San Joaquin River Problems Conference. They met to consider with State and Federal officials what could be done in the face of the extremely dry season which was indicated that year as early as January.

GOOD WORK DONE

As the result of that conference there was appointed to represent the water users, what is known as the Permanent Committee of the Sacramento-San Joaquin River Problems Conference. This committee was charged with the responsibility not only of taking every possible step to relieve the situation of 1924, but of seeking a permanent solution to these water difficulties of the valley.

The steps taken in 1924 are past history, but it should be remembered that through the splendid cooperation of all water users both in the delta and upriver, the committee, and the State and Federal agencies, the season was passed with a minimum of loss, with the greatest relief possible to the delta in its salinity encroachment, with restraint by the War Department in the strict enforcement of its authority to require that the river flow be maintained for navigation, and of tremendous importance, with active prosecution of the Delta vs. Upriver litigation, affecting practically every water user in the valley, held in abeyance.

TO PREVENT WASTE

It was in this year that the office of Water Supervisor was established to work for maximum conserva-

Water Conservation Campaign Begun

(Continued from page 25.)

tion and waste prevention and to commence the collection of records of all diversions, stream flow, return flow, salinity, and water requirements and uses throughout the Sacramento-San Joaquin territory. As one method of best utilizing existing water supplies and in lieu of any adjudication of water rights, it was considered that this collection of all data might furnish the basis ultimately for a mutual agreement as to water allocation and its distribution accordingly by a water master.

The Permanent Committee has actively continued its work in the succeeding subnormal seasons, and now with a repetition of 1924 before it in 1931 has taken action to proceed in cooperation with the State, represented by the Division of Water Resources, in much the same manner as in 1924. The Federal Government has a vital interest in the situation from the standpoint of navigation, and is, therefore, through the District Engineer, Corps of Engineers U. S. A., an active party to the cooperative effort.

WARNING TO USERS

As the result of an early meeting of the Permanent Committee with State and Federal officials on March 26, 1931, letters were sent out to all water users calling attention to the situation and recommending as the most effective step which could be taken at that time, the reduction and elimination as much as possible of crop plantings such as rice which would require large amounts of water in July and August. Letters with a similar recommendation were sent out also by the District Engineer, Corps of Engineers, United States War Department, and by the office of the California Rice Growers' Association. Junior permittees under appropriate water rights before the Division of Water Resources were also apprised of their inferior position in the event that the water shortage should require the cutting of diversions in the inverse order of priority.

There was a fair response to these letters, but in spite of every action, the check in early May indicated that the rice acreage being irrigated from the river and tributaries above Sacramento was approximately 26 per cent greater than the 1924 acreage and above Colusa, 34 per cent greater.

STREAM FLOW FIGURES

At a meeting on May 28th the facts presented to the committee showed the following stream flow:

	<i>Second-foot</i>
Sacramento River at Red Bluff.....	3300
Sacramento River at Butte City.....	2060
Sacramento River at Colusa.....	1870
Sacramento River at Knights Landing.....	1000
Feather River at Nicolaus.....	760
Sacramento River at Verona.....	1600
American River at Sacramento.....	950
Sacramento River at Sacramento.....	2300
San Joaquin River near Vernalis.....	400
Combined flow of Sacramento and San Joaquin Rivers to delta.....	*2700

* A lesser flow than that in 1924 at the corresponding time.

It was shown also that there was a draft by major projects only on the Sacramento River from Red Bluff to Sacramento of 3900 second-feet; that this was being diverted for approximately 75,000 acres of rice and 68,000 acres of general crops or a total of 143,000 acres; that water levels were such that on the section of river between Colusa and Knights Landing a drop of very little more would cause the intakes of two or more of the largest pumping plants to be out of water; that tests in the upper bay and lower delta area evidence a salinity encroachment considerably in advance of that in 1924 at the same period; and that without consideration of the delta requirements and the salinity problem, not only low levels but an actual shortage of water for upriver acreage appeared to be impending.

MOVE TO HALT WASTE

A comparison of river diversions with the waste and return water as measured in the various drainage channels indicated that there existed a waste possible of and demanding prevention, and in view of all facts as presented, the decision was reached that an intensive campaign for conservation and waste prevention should be immediately inaugurated.

Letters were sent out to all upriver water users presenting the absolute necessity for the prevention of waste and advising that the rule to be followed by the Water Supervisor would be to cut river diversions by the amount of wastage found under them. The responsibility for waste prevention by adequate provision for inspectors, water masters, etc., in their field organization was placed upon the larger projects and each of the major districts was asked to designate a Conservation Officer to patrol and represent his district in its cooperation with the State Water Supervisor and the Federal officials. Arrangements were made for the inspection of the use and regulation of water on the various projects by a representative of the War Department and the Water Supervisor in cooperation with the Conservation Officer.

These measures are being effected at this writing and the indications are for a ready and sincere response upon the part of the water users as a whole. It remains to be seen whether or not a strict prevention of waste without further and more drastic regulation, will be sufficient to meet the situation and avert conflict.

Done o'Clock

The time of day I do not tell,
As some do, by the clock,
Or by the distant chiming bells
Set on the steeple rack,
But by the progress that I see
In what I have to do.
It's either Done o'Clock to me
Or only Half-Past Through.

—John Kendrick Bangs.

A highway tree-planting program has been developed in Orange County calling for beautification of scenic roads and sections along other highways where there are no orchards.

Cato Speech Stirs Patrol Officers

Grizzly inspectors of the California Highway Patrol, many of them grey-haired veterans of police work in the State, went to school again this month. They spent nearly two weeks at the patrol school in the Fair Grounds attending classes, and they liked it. As proof, here follows an article by one of them, lauding the work done and the policies laid down.

By F. G. YODER, District Inspector and Senior Instructor

IF the enthusiasm displayed by the executive class of the California Highway Patrol, just adjourned at the State Fair Grounds, can be taken as a criterion or barometer of the future success of the patrol, that future success is assured.

We of the school have watched with considerable pride the growing confidence, not only of the public in the patrol, but of the patrol in itself. You may ask, "Why has not the patrol always had confidence in itself?" The answer is simple, and we believe you are entitled to it. They have not had complete confidence in themselves, because of dual control, because of questioned ratings, because of doubtful seniority, and because of the lack of a uniform interpretation of their duties and administration policy.

CATO MAKES HIT

The training school has, aside from instruction, done much to standardize control and responsibility through the contracting of various units throughout the State, but the big and final argument, the one that put the executive class on the "dotted line," occurred when Superintendent E. Raymond Cato stood before the class and said:

"Submit to me your ideas as to the best method of conducting the business of your district. Tell me your troubles, I want to share them with you. This is **OUR** organization, not **MY** organization. I want to make it the best law enforcement agency of its kind in the world. I can not do it, but **WE** can, and after we have agreed upon a policy that will give to the people of this State the utmost protection and service, go back to your districts, put into effect that policy and I will stand behind you."

GIVEN IMPETUS

No man has ever stood before the executives of this organization and sold them to themselves as did Superintendent Cato. No organ-

ization could expect a superior to say more, and with these thoughts and assurances fresh in their minds they set about the formulation of plans and policies that, when put into effect, will make the patrol one of the greatest agencies for the protection of life, limb and property and for the promotion of the motorists' welfare and happiness in the history of automobiles.

Governmental efficiency was very clearly explained to the executives by California's Director of the Department of Finance, the Hon. Rolland A. Vandegrift, and the motorist viewpoint was frankly discussed by Ivan E. Kelso, General Council of the Automobile Club of Southern California. Both pictures were well presented, understood and appreciated.

The department heads and district inspectors left with a spirit of unity and a desire to serve. They will carry "a message to Garcia." You Californians who have been accused of boosting things Californian, keep your eye on the California Highway Patrol.

MAKE ACTING CAPTAINS

E. Raymond Cato, Superintendent of the California Highway Patrol, announces that Otto Buer, former traffic officer of Orange County, and W. H. Rutherford, former traffic officer of Santa Barbara County, have been named acting captains in Inyo and Santa Barbara counties, respectively.

It was also announced that Officer Ernest Carr of Fresno County had been transferred temporarily to Mono County.

Wisconsin is now busily building overhead railroad grade crossings with two thoughts in mind—elimination of her most heavily traveled and dangerous grade crossings and opening up of employment. Twenty-six overhead crossings had been awarded for construction during May and bids have been received on seven more, and since then ten more have been advertised for bids. The Wisconsin program calls for the construction this year, with the cooperation of the railroads, of the 90 overheads which were to have been built in 1931, 1932 and 1933.

Millions Turned Into Trade Channels As Governor's Work Program Speeds Up

GOVERNOR ROLPH'S program for speeding up public improvements as a measure of alleviation for unemployment, is well under way and with gratifying results.

The State Department of Public Works is fully up on the schedule of activities assigned to it. The figures covering the first six months' progress are substantial evidence of accomplishment.

Employment has been provided for thousands of citizens. Millions of dollars have been turned into the channels of trade. The improvements have been well planned. They are being carried forward under careful supervision.

MANY MEN EMPLOYED

The Highway Division makes an excellent showing. The following figures speak for themselves:

Showing, as of June 10th, the number of men *exclusive of staff and office force* employed directly or by contractors on improvement work by the Division of Highways, State Department of Public Works:

District	Men employed	
	Day labor	Contract labor
1-----	507-----	225-----
2-----	438-----	314-----
3-----	276-----	274-----
4-----	405-----	262-----
5-----	228-----	289-----
6-----	297-----	66-----
7-----	599-----	410-----
8-----	220-----	602-----
9-----	113-----	20-----
10-----	247-----	169-----
Bridges-----	-----	300-----
Total-----	3330-----	2931-----

Total day labor and contract-----	6,261
Total of contracts under way as of June 1-----	\$16,117,000
Total day labor (not including penal)-----	2,237,000
Total work to be awarded next three months-----	8,150,000
Total maintenance costs for 1931-----	6,502,170

The minimum cost of labor on this class of work is 70 per cent of the total. Of the remaining 30 per cent (for materials, etc.) labor takes an equal share.

These figures do not include any staff employees nor any labor from the penal camps.

ACCELERATED PROGRAM

The Division of Architecture is carrying forward an accelerated program of construction that is at this date giving employment to 2042 men. The contracted outlay calls for \$5,868,000. About 100 projects are represented in the activities under way.

The division has a program for the next six months that will add about 80 per cent to the total of expenditures and to the number of men employed. Sixty projects, of the aggregate cost of \$4,751,000 and providing employment for 1650 men, will be launched. The average period of employment is 10 months. In other words, this division has a \$10,000,000 program for the year, and it is being advanced on schedule.

The list of projects for the next six months is about ready for announcement. Meanwhile, the list of those under way will be of much interest.

Institution	Project	Amount
Agricultural Park-----	Live stock building-----	\$140,000
Calif. Polytech. School-----	Dormitory-----	40,000
Agnews Hospital-----	Farm unit No. 2-----	355,000
San Francisco State Bldg.-----	Completion-----	210,000
Whittier School-----	Cottage for boys-----	45,000
Mendocino Hospital-----	Completion of ward 7-----	70,000
Norwalk Hospital-----	Night attendants' building-----	40,000
Norwalk Hospital-----	Day attendants' building-----	36,000
San Diego College-----	Students' union-----	16,000
San Diego College-----	Athletic field-----	15,000
Norwalk Hospital-----	Assistant physician's cottage-----	10,000
Stockton Hospital-----	Employees' cottages-----	40,000
Patton Hospital-----	Infirmaries unit No. 2-----	40,000
Agricultural Park-----	Poultry building-----	60,625
San Diego College-----	Linoleum installation-----	10,000
Agnews Hospital-----	Attendants' quarters-----	100,000
Pacific Colony-----	Employees' quarters and garage-----	54,000
Div. of Highways-----	Improvements, Sacramento office-----	1,200
San Jose College-----	Completion of natatorium-----	50,000
Ohio College-----	Completion of auditorium-----	19,000
Div. of Highways-----	San Luis Obispo Office Bldg.-----	36,000
Sonoma Home-----	Commissary-----	26,500
Mendocino Hospital-----	Ward building-----	90,000
Pacific Colony-----	Hospital building-----	113,000
Pacific Colony-----	Administration building-----	33,000
National Guard-----	Yuba City armory-----	25,000
Patton Hospital-----	Employees' cottages-----	50,000
San Diego College-----	Scraps cottage-----	11,000
Div. of Motor Vehicles-----	Improvements, Sacramento office-----	5,500
National Guard-----	Oakland rifle range-----	7,500
Narcotic Hospital-----	Sewer line-----	840
Cal. Inst. for Women-----	Two ward buildings-----	106,000
Cal. Inst. for Women-----	Administration building-----	100,000
Sonoma Home-----	Water system-----	9,500
San Diego College-----	Sewage plant work-----	5,225



THE START—A long trek ahead in Del Norte County. Clearing operations, these, for a new highway but a pretty bumpy spot right now.



DOWN THE STRETCH—But no stretch of the imagination to picture the top scene as looking like this one pronto. This is a finishing machine at work south of Fresno. And on the right we see how the State keeps up the good work. The man with the funny looking dingbat is plugging up small holes on an otherwise perfectly good highway.

Institution	Project	Amount	Institution	Project	Amount
San Quentin Prison	Wharf	12,000	School for Deaf	Dormitory, kitchen and commissary	300,000
Los Angeles State Bldg.	Completion	607,350	Whittier School	Kitchen	80,000
Napa Hospital	Improvements to water well	1,600	Stockton Hospital	Hospital building	92,000
Sacramento State			Narcotic Hospital	Ward building	22,000
Office Bldg.	Improvements on fifth floor	1,000	Narcotic Hospital	Industrial shop and gymnasium	10,500
Cal. Inst. for Women	Service connections	51,000	Stockton Hospital	Industrial building	25,000
Div. of Motor Vehicles	Improvements, Sacramento office	200	Agnews Hospital	Ward unit No. 1	342,500
Pacific Colony	Miscellaneous improvements	3,500	Agnews Hospital	Physician's cottage	10,000
Agricultural park	Well and pump	4,785	Patton Hospital	Quarters for infirm patients	45,000
Ventura School			Whittier School	New boiler	18,000
for Girls	Pump	1,625	Pacific Colony	New boiler	16,500
School for Deaf	Painting	857	Sonoma Home	Alterations to dining room	10,200
Norwalk Hospital	Well and pump	18,637	Los Angeles State Bldg.		1,250,000
Preston School	Water supply	69,000	Narcotic Hospital	Receiving building	28,000
Folsom Prison	Sewage disposal	50,000	Napa Hospital	Repairs and improvements	12,300
Preston school	Industrial shop building	14,500	Norwalk Hospital	Refrigeration	6,800
San Quentin Prison	Warehouse	50,000	Patton Hospital	Miscellaneous construction	7,381
Preston School	Alterations to Refectory building	5,000	Patton Hospital	Roof repairs	10,600
San Quentin Prison	Extension to dining room	74,000	Veterans' Home	Boiler	16,100
Sonoma Home	Alterations to dining room	10,200	Agnews Hospital	Elevators	4,320
San Quentin Prison	Library building	24,000	San Diego College	Roads and walks	6,000
Folsom Prison	Foundations for cell block	25,000	Pacific Colony	Industrial building	10,000
Folsom Prison	Guards' cottages	25,000	San Diego College	Irrigation system	7,000
San Quentin Prison	Laundry	45,000	Attorney General	Improvements in San Francisco office	7,500
Folsom Prison	Remodel old Administration Bldg.	20,000	Stockton Hospital	Alterations to calf barn	2,500
San Quentin Prison	Guards' cottages	25,000	Stockton Hospital	Fire line	1,865
Folsom Prison	Cannery	20,000	School for Blind	Grading	1,750
Folsom Prison	Heating system	3,950	Div. of Highways	Repairs to vault, Sacramento	200
Sonoma Home	Laundry addition	10,900	Narcotic Hospital	Superintendent's office	1,500
Preston School	Superintendent's cottage	33,500	Veterans' Home	Gas and oil burners	3,000
Chico College	Assembly building	186,000			
San Jose College	Gymnasium	130,000	Total		\$5,868,016

Bridge Links Entire Pacific Coast

THE entire Pacific coast, from British Columbia to the Mexican line, joined hands on May 23 in celebrating opening and completion of the new bridge spanning the Rogue River, northern terminus of the Redwood Empire, at Grants Pass. The celebration was sponsored by the Redwood Empire Association in cooperation with the Grants Pass Chamber of Commerce and the Oregon Cavemen, Inc.

The bridge is a \$125,000 concrete structure, requiring 11 months to construct.

STRATEGIC POINT

High Federal, State, provincial, county and city officials were in attendance, together with executives of large and small community and

Garrison, Director of California State Department of Public Works, officially representing Governor Rolph of California; George W. Joseph, Jr., officially representing Governor Julius L. Meier of Oregon; C. H. Purcell, California State Highway Engineer; Edward Morris, President of the Redwood Empire Association; O. S. Blanchard, Vice President of the Redwood Empire Association and master of ceremonies; and Maj. Gen. Smedley Butler, and other dignitaries.

GREATER TRAVEL

Preceding the dedication ceremonies and celebration features, there took place in Grants Pass Friday evening, May 22d, and at Saturday noon, May 23d, a speaking pro-



HE'S A CAVEMAN—It's General Butler of the Marines in an unusual pose. The officer is being initiated as a caveman or what have you by a band of fierce looking warriors at ceremonies attending dedication of the Rogue River Bridge.

district advertising and publicity institutions, chambers of commerce, transportation executives, newspaper publishers, and others from California, Oregon, Washington and British Columbia.

The bridge was officially dedicated to "Greater Pacific coast travel," by virtue of its strategic location at a main distributing point for Pacific coast travel.

The "barrier"—in the form of a wide ribbon—was clipped by H. B. Van Dusen of Portland, Chairman of the Oregon Highway Commission, surrounded by Col. Walter E.

gram, in which presidents, directors and managers of major community and district advertising institutions, also chambers of commerce and auto club executives, presented ideas about greater interchange of travel on the Pacific coast, which movement was initiated and sponsored by the Redwood Empire Association.

Grants Pass was the objective for huge delegations from various Pacific coast points, coming in by caravans numbering 50 to 60 cars each, by airplane, by special train, and in the form of individual parties.



A THING OF BEAUTY and a joy forever—The Rogue River Bridge, northern terminus of the Redwood Empire at Grants Pass. The structure built at a cost of \$125,000 was opened May 23d with ceremonies attended by a large delegation from Pacific coast points.

“Don’t Speed” Signs Along Roads Urged To Prevent Crashes

Signs along open stretches of State highway, where the temptation to speed is greatest, warning the motorist that the maximum speed limit must not be exceeded, are being considered by State highway officials as a means of reducing the automobile’s toll of death and injured.

Believing that the major part of all fatal accidents may be traced to excessive speed, E. Raymond Cato, Superintendent of the California Highway Patrol, has made the suggestion for such signs in a letter to T. H. Dennis, Maintenance Engineer of the Division of Highways.

Conferences are being arranged between Cato, Dennis, Col. W. E. Garrison, Director of Public Works, and other highway officials to discuss the feasibility of the plan.

The new maximum speed limit of 45 miles an hour becomes effective August 14. Cato is determined that this shall be the limit in fact as well as in name and has so instructed his officers.

In going into the matter, Cato has discovered there are plenty of signs all over the State designating the maximum speed limits in business and resident districts, but that there are no signs whatever out on the open highway where many of the fatal accidents occur.

The patrol superintendent suggests in his letter that such signs be displayed at convenient points about the State calling attention to the maximum speed limit that will prevail when the new law goes into effect.

Road Builders Meet In Detroit in 1932 for Convention and Show

The twenty-ninth annual convention and road show of the American Builders’ Association will be held in Detroit, January 9 to 15, 1932.

Decision as to the location of the road show has just been made by association officers after consideration of the advantages of several large cities that made strong efforts to get the road show.

The Detroit Airport Building will be used for both the convention and the road show. All exhibit space is on the ground floor and the huge doors make possible the setting of the largest equipment without difficulty.

A new plan of housing delegates will be followed this year. An effort will be made to house all road builders whose interests are alike in the same hotel, city people to one hotel, county in another, Pan-American in still another and so on through the list. This plan will facilitate locating people at their hotels.

Headquarters hotels will be the Statler and the Book-Cadillac. Division headquarters will be maintained at these hotels.

All classes and types of equipment and material for the construction, maintenance and operation of streets and highways will be on display.

Hardly more than a score of toll roads still exist in the United States, all of them being privately owned. The total length is estimated at less than 150 miles, according to the Bureau of Public Roads, U. S. Department of Agriculture, as contrasted to the 3,000,000 miles of the public-road system. Thirty-five states have no toll roads of any kind.

Highway Bids and Awards for May

ALPINE COUNTY—Between Hangmans Bridge and the State Highway Camp. About 10.6 miles to be oil treated. Dist. X, Rt. 23, Sec. C, D and E, Pacific Tank Lines, Inc., Los Angeles, \$3,164; U. B. Lee, San Leandro, \$2,950; D. McDonald, Sacramento, \$3,181. Contract awarded to Basalt Rock Company, Inc., Napa, \$2,822.

ALPINE, CALAVERAS AND TUOLUMNE COUNTIES—Between Long Barn and the foot of Sonora Pass grade, about 25 miles; between Big Trees and Lake Alpine, about 19.5 miles, oiling. Dist. X, Rts. 13 and 24, Sec. E F G & H, F G & A. D. McDonald, Sacramento, \$12,816. Contract awarded to Basalt Rock Company, Inc., Napa, \$12,525.

EL DORADO COUNTY—Between Placerville and Railroad Crossing. About 1.7 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. 111, Rt. 11, Sec. D, Fred W. Nighbert, Bakersfield, \$68,041; Force Construction Co., Piedmont, \$61,786; Tiffany-McReynolds-Tiffany, San Jose, \$74,686; Kennedy-Bayes Construction Co., Biggs, \$73,312. Contract awarded to Finnell Company, Inc., Sacramento, \$52,593.

KERN COUNTY—Oiling between Canebrake Creek and junctions with Routes 57 and 23, 11.37 miles. Dist. IX, Rt. 57, Sec. K & L, F. W. Nighbert, Bakersfield, \$4,467; Gilmore Oil Co., Los Angeles, \$3,323; California Road Oil Service Co., \$3,720. Contract awarded to Pacific Tank Line, Los Angeles, \$3,100.

LASEN AND MODOC COUNTIES—Between Hillside and Rush Creek, 24.5 miles to be surfaced with bituminous treated crushed gravel or stone. Dist. II, Rt. 28, Sec. A B A, Granite Construction Co., Watsonville, \$135,834; Fred W. Nighbert, Bakersfield, \$148,796; Hein Bros. & Basalt Rock Co., Napa, \$136,873; A. Teichert & Son, Inc., Sacramento, \$138,118. Contract awarded to Hemstreet & Bell, Marysville, \$129,646.

LOS ANGELES COUNTY—Between Santa Clara River and 0.6 mile north of Castaic School, 6.3 miles, oiling shoulders. Dist. VII, Rt. 4, Sec. A & B, Wm. P. Andrews Oil Co., Long Beach, \$1,466; The Square Oil Company, Inc., Los Angeles, \$1,533; The Petrol Corporation, Los Angeles, \$1,734; Pacific Tank Lines, Inc., Los Angeles, \$1,833; California Road Oil Service Company, Ltd., Wilmington, \$1,931; Gilmore Oil Company, Ltd., Los Angeles, \$2,227. Contract awarded to California Crane Service, Los Angeles, \$1,339.

LOS ANGELES AND ORANGE COUNTIES—Between San Gabriel River and Corona del Mar, 15.4 miles, oiling shoulders. Dist. VII, Rt. 60, Sec. E A & B, California Crane Service, Los Angeles, \$6,336; The Petrol Corporation, Los Angeles, \$6,638; Leonard C. Pulley, Long Beach, \$7,060; California Road Oil Service Co., Wilmington, \$7,483; Gilmore Oil Company, Ltd., Los Angeles, \$8,026. Contract awarded to Square Oil Company, Inc., Los Angeles, \$5,310.

LOS ANGELES AND VENTURA COUNTIES—Between Calabasas and top of Conejo Grade, 21.2 miles; between Camarillo and Telegraph Road, Ventura, 13.2 miles, oiling shoulders. Dist. VII, Rt. 2, Sec. C A B & C, C. A. Cook & J. J. Clark, Santa Barbara, \$2,487; California Crane Service, Los

Angeles, \$2,487; The Petrol Corporation, Los Angeles, \$2,587; Pacific Tank Lines, Inc., Los Angeles, \$2,587; Square Oil Company, Inc., Los Angeles, \$2,646; Gilmore Oil Company, Ltd., Los Angeles, \$3,164. Contract awarded to California Road Oil Service Company, Ltd., Wilmington, \$2,467.

LOS ANGELES AND VENTURA COUNTIES—Between Santa Monica and Calleguas Creek. Oiling shoulders, 31.6 miles. Dist. VII, Rt. 60, Sec. A and B, Square Oil Company, Inc., Los Angeles, \$8,095; California Crane Service, Los Angeles, \$9,825; California Road Oil Service Co., Wilmington, \$10,060; The Petrol Corporation, Los Angeles, \$11,004; Pacific Tank Lines, Inc., Los Angeles, \$11,161; Gilmore Oil Company, Ltd., Los Angeles, \$12,654. Contract awarded to Wm. P. Andrews Oil Co., Long Beach, \$8,017.

MODOC COUNTY—Between Rush Creek and Hot Creek, 23.5 miles to be surfaced with bituminous macadam treated crushed gravel or stone surfacing. Dist. II, Rt. 28, Sec. A and B, Finnell Company, Inc., Sacramento, \$157,260; Granite Construction Co., Ltd., Watsonville, \$135,600; U. B. Lee, San Leandro, \$142,435; F. W. Nighbert, Bakersfield, \$147,200; A. Teichert & Son, Inc., Sacramento, \$143,310; Hemstreet & Bell, Marysville, \$136,415. Contract awarded to Hartman Construction Co., Bakersfield, \$134,875.

MONO COUNTY—1.9 miles south of Coleville to 1.2 miles south of Coleville, grading. Dist. IX, Rt. 23, Sec. K, D. C. Follis, Compton, \$6,022; Robinson-Roberts Co., Los Angeles, \$6,484. Contract awarded to Kennedy-Bayles Construction Co., Biggs, \$5,290.

MONTEREY COUNTY—Between Chualar and Salinas, about 10.1 miles to be oiled 8 feet each side of existing pavement. Dist. V, Rt. 2, Sec. B, C. A. Ladeveze, South Gate, \$18,248; Fred W. Nighbert, Bakersfield, \$17,305; Cornwall Construction Co., Santa Barbara, \$17,294; W. A. Dontanville, Salinas, \$19,371; J. F. Knapp, Oakland, \$15,497; Granite Construction Company, Ltd., Watsonville, \$16,508; U. B. Lee, San Leandro, \$19,203. Contract awarded to C. W. Wood, Stockton, \$15,104.

MONTEREY COUNTY—Between San Lucas and 0.9 mile east of San Lorenzo Creek, about 14 miles to be seal coated. Dist. V, Rt. 10, Sec. A & B, Roselip Products Co., San Luis Obispo, \$8,056; Cornwall Construction Co., Santa Barbara, \$8,990; Fred W. Nighbert, Bakersfield, \$11,950. Contract awarded to Granite Construction Co., Watsonville, \$7,894.

MONTEREY COUNTY—Between San Lucas and a point 3.5 miles north, oiling shoulders. Dist. V, Rt. 2, Sec. F & G, Fred W. Nighbert, Bakersfield, \$5,616; Cornwall Construction Co., Santa Barbara, \$4,976; Roselip Products Co., San Luis Obispo, \$5,460; W. A. Dontanville, Salinas, \$5,850; Tiffany-McReynolds-Tiffany, San Jose, \$7,722. Contract awarded to Granite Construction Company, Ltd., Watsonville, \$4,976.

NEVADA COUNTY—Between Donner Lake and one mile west of Truckee, placing underdrains at various locations. Dist. III, Rt. 37, Sec. D, Martin Murphy, Berkeley, \$8,970. Contract awarded to Harms Bros., Galt, \$5,103.

Work Covers All Sections of State

ORANGE COUNTY—Between San Mateo Creek and Serra. About 5.5 miles to be graded and paved with Portland cement concrete and asphaltic concrete. Dist. VII, Rt. 2, Sec. A. C. G. Willis & Sons, Inc., Los Angeles, \$309,631; Southwest Paving Co., Los Angeles, \$298,087; Ed. Johnson & Sons, Los Angeles, \$339,260; Geo. H. Oswald, Los Angeles, \$307,999; David H. Ryan, San Diego, \$294,083; Gibbons & Reed Co., Burbank, \$338,867; O. A. Lindberg, Stockton, \$345,883; Macco Construction Co., Clearwater, \$356,571; Daley Corporation, San Diego, \$367,912; Griffith Company, Los Angeles, \$324,244. Contract awarded to Jahn & Bressi Construction Co., Inc., Los Angeles, \$282,107.

ORANGE COUNTY—Reconstructing and widening bridge across Santa Ana River 2 miles north of Newport Beach. Dist. VII, Rt. 60, Sec. A, J. S. Metzger & Son, Los Angeles, \$69,217; R. R. Bishop, Long Beach, \$71,718; Owl Truck Company, Inc., Compton, \$70,763; Merritt-Chapman & Scott Corporation, San Pedro, \$64,298; Herbert M. Baruch Corporation, Ltd., Los Angeles, \$72,549; Oberg Bros., Los Angeles, \$64,840. Contract awarded to Nead Construction Co., Wilmington, \$59,947.

PLACER COUNTY—Between Wise Power House and Auburn. About 1.4 miles to be graded and paved with Portland cement concrete. Dist. III, Rt. 17, Sec. B, Clark & Henery Construction Co., San Francisco, \$182,063; C. W. Wood, Stockton, \$174,699; Granfield, Farrar & Carlin, San Francisco, \$171,507; Gist & Bell, Arcadia, \$209,886; W. H. Hauser, Oakland, \$161,787; George Pollock Co., Sacramento, \$184,707; McCray Co., Los Angeles, \$195,121. Contract awarded to Fredrickson & Watson Construction Co., and Fredrickson Bros., Oakland, \$147,585.

SACRAMENTO COUNTY—Between Brighton and Mills, 7.2 miles grading and paving with Portland cement concrete. Dist. III, Rt. 11, Sec. B, Clark & Henery, San Francisco, \$222,076; C. W. Wood, Stockton, \$216,396; N. M. Ball, Porterville, \$200,534; Hanrahan Co., San Francisco, \$202,060; A. Teichert & Son, Sacramento, \$241,561; M. J. Bevanda, Stockton, \$222,187. Contract awarded to Basich Brothers, Torrance, \$199,365.

SAN BERNARDINO COUNTY—Between Fawskin and County Road to Pine Knot. About 6.4 miles, heavy fuel oil to be furnished and spread. Dist. VIII, Rt. 43, Sec. D, Pacific Tank Lines, Inc., Los Angeles, \$1,901; California Road Oil Service Co., Wilmington, \$2,209. Contract awarded to Gilmore Oil Company, Ltd., Los Angeles, \$1,608.

SAN BERNARDINO COUNTY—Between Kern County line and Barstow, 37.1 miles to be oiled. Dist. VIII, Rt. 58, Sec. A B C & D, Pacific Tank Lines, Inc., Los Angeles, \$7,369; California Road Oil Service Co., Wilmington, \$7,752; Gilmore Oil Company, Ltd., Los Angeles, \$7,098; California Crane Service, Los Angeles, \$7,472; Petrol Corporation, Los Angeles, \$7,121. Contract awarded to Square Oil Company, Inc., Los Angeles, \$6,257.

SAN DIEGO AND ORANGE COUNTIES—Between San Diego and San Mateo Flat and between Galivan and Irvine, oiling shoulders, 32.2 miles. Dist. VII, Rt. 2, Sec. A B C D B, The Petrol Corporation, Los Angeles, \$6,012; California Road Oil Service Co.,

Wilmington, \$6,380; Pacific Tank Lines, Inc., Los Angeles, \$6,701; Orange County Refining Co., Los Angeles, \$6,747; Gilmore Oil Company, Ltd., Los Angeles, \$6,976. Contract awarded to Square Oil Company, Inc., Los Angeles, \$5,186.

SAN JOAQUIN COUNTY—Between French Camp and Stockton, 3.5 miles, to be graded and surfaced with bituminous treated gravel. Dist. X, Rt. 5, Sec. B, Willard & Biasotti, Stockton, \$46,855; Force Construction Co., Piedmont, \$50,512; Fred W. Nighbert, Bakersfield, \$55,390; Valley Paving and Construction Co., Fresno, \$44,830; Clark & Henery Construction Co., San Francisco, \$51,813. Contract awarded to C. W. Wood, Stockton, \$44,660.

SAN LUIS OBISPO COUNTY—Between San Simeon and Piedras Blancas Lighthouse, about 6.2 miles to be oiled. Dist. V, Rt. 56, Sec. A, Tiffany-McKeynolds-Tiffany, San Jose, \$3,120; Granite Construction Company, Ltd., Watsonville, \$3,142; Brisco & Son, Arroyo Grande, \$1,971; Roselip Products Co., San Luis Obispo, \$1,981; Bradley Truck Co., Santa Maria, \$1,620. Contract awarded to W. A. Dontanville, Salinas, \$1,600.

SANTA BARBARA COUNTY—Reconstructing floor of Santa Ynez River Bridge, about 1 mile south of Buellton. Dist. V, Rt. 2, Sec. D, Oberg Bros., Los Angeles, \$24,639; Gist & Bell, Arcadia, \$19,718; Johnson Construction Co., Los Angeles, \$23,649. Contract awarded to Neves & Harp, Santa Clara, \$18,099.

SANTA BARBARA COUNTY—Between Guckhorn Creek and second crossing of Cuyama River, about 15.5 miles, to be surfaced with asphaltic treated screenings. Dist. V, Rt. 57, Sec. B, Santa Maria Construction Co., Santa Maria, \$12,375; Lang Transportation Co., \$16,160. Contract awarded to J. F. Knapp, Oakland, \$11,782.

SANTA CRUZ COUNTY—Between 1 mile north of Santa Cruz and Santa Cruz, to be graded and surfaced with crusher run base and paved with bituminous macadam. Dist. IV, Rt. 5, Sec. A, W. H. Hauser, Oakland, \$64,073; Healy-Tibbitts Construction Co., San Francisco, \$48,486; Granfield, Farrar & Carlin, San Francisco, \$50,558; J. L. Conner, Monterey, \$43,737; Granite Construction Company, Ltd., Watsonville, \$42,789; Couteaux Construction Co., San Francisco, \$48,539; Irving L. Ryder, San Jose, \$48,485; Ariss-Knapp Co., Oakland, \$52,999. Contract awarded to C. W. Wood, Stockton, \$42,084.

TRINITY COUNTY—Bridge across North Fork of Trinity River near Helena, one 150-foot through steel truss span and two 47-foot, 2-inch concrete girder spans on concrete piers and abutments. Dist. II, Rt. 20, Sec. E & F, F. J. Maurer & Son, Inc., Eureka, \$43,658; A. Young, Yreka, \$50,674; Ralph McLeran & Co., San Francisco, \$43,483; A. T. Howe, Santa Rosa, \$42,581; R. B. McKenzie, Red Bluff, \$45,700. Contract awarded to F. H. Nielson, Orland, \$39,089.

TRINITY COUNTY—Approaches to Browns Valley Creek and Trinity River Bridges. About 0.5 mile to be graded and surfaced with untreated crushed gravel or stone. Dist. II, Rt. 20, Sec. A, A. Young, Yreka, \$21,126; Chas. N. Chittenden, Napa, \$21,852.

(Continued on next page.)

Quick Thinking and Officers' Skill Save Lives of Two Trapped Fishermen

QUICK work on the part of two California Highway Patrolmen and the skill of a Highway Maintenance Department Foreman, saved the lives of two fishermen a few weeks ago and won the commendation of the citizens of Ventura County.

Officers R. J. Parr and Joe Nobel and Foreman Glenn Cheeseman were the principals in the thrilling rescue of Jack Eaton of Santa Monica and Byron Woodford, Venice, caught by high tide and a heavy sea on a rock 300 feet off Deer Canyon along the Roosevelt Highway.

As a result of the near tragedy, Thornhill Broome, owner of the property, has placed ropes and life savers at strategic points on his land for use of the highway patrol in the event of another emergency. The following story from the Los Angeles Times gives details of the rescue:

Two men, Jack Eaton, 31 years of age, of 18 Grant street, Santa Monica, and Byron Woodford, 31, of 811 Crestmore place, Venice, owe their lives to the California Highway Patrol as a result of a spectacular and timely rescue which occurred on the Roosevelt Coast Highway about 15 miles south of Oxnard.

A crowd of several hundred excited motorists lined the edge of the highway that skirts the rugged coast to watch State Officers Bob Parr and Joe Nobel rescue the two men from what would have been a certain watery grave.

Eaton and Woodford, with their wives, were fishing from the rocks earlier in the day. The two women retreated to the highway far above the surf at noon. The two men, intent upon catching more fish, ventured out to the end of a 300-foot strip of rock. By 3 o'clock the tide, unnoticed by anyone, had risen completely surrounding the two fishermen.

Officers Parr and Nobel, patrolling the highway, noticed the two men offshore, apparently unaware of their danger. The open ocean lay before them while a pounding surf beat on the rocks behind them. They were fishing from a high spot on the rocks not more than six feet in circumference.

The officers secured a long rope from the State Highway Maintenance Camp at Sycamore Canyon, several miles away, and with the assistance of Foreman Glenn Cheeseman, started the rescue. It was not until then that Eaton and Woodford realized the seriousness of the situation.

Abandoning their fish and lines, they tried to catch the life line. Fourteen attempts were made before Eaton was pulled from the rock to safety. The water by this time had reached the top of the rock.

Woodford was washed from the spot by mounting waves almost the instant he finally caught the weight at the end of the rope that was flung to him by one of the officers who was perched on a nearby ledge. Although badly tossed about by the heavy seas he managed to hang on and was dragged to safety.

An hour later the rock on which the men had been fishing was under water with high waves pounding on all sides.

Had they not been spotted by the two officers in time they undoubtedly would have soon been

washed away and dashed to death. Last year seven people lost their lives in similar manner along this coast, and several at this very spot.



THREE MUSKETEERS—They look happy and they should for they are the lads whose quick thinking and skill saved the lives of two anglers. From left to right—Joe Nobel, Glenn Cheeseman and R. J. Parr.

HIGHWAY CONSTRUCTION WORK AWARDED DURING PAST MONTH

(Continued from page 33.)

Contract awarded to H. H. Boomer, San Francisco, \$19,800.

TULARE COUNTY—Between Goshen and Kingsburg, constructing 4 new bridges and widening 2 bridges. Dist. VI, Rt. 1, Sec. E, Fredrickson and Watson, Oakland, \$40,767; Thermotte Construction Co., San Jose, \$37,209; Geo. J. Ulrich Construction Co., Modesto, \$37,294; Oberg Bros., Los Angeles, \$46,085; L. C. Clark & C. E. Doughty, Visalia, \$36,322. Contract awarded to J. S. Metzger & Son, Los Angeles, \$36,290.

YOLO AND COLUSA COUNTIES—Between Dunnigan and 1 mile south of Arbuckle, 8.7 miles, rock borders. Dist. 11, Rt. 7, Sec. C A, A. Teichert & Son, Sacramento, \$24,495. Contract awarded to Fred W. Nighbert, Bakersfield, \$24,140.



WHERE LIVES WERE SAVED—Above are the rocks at low tide, number 1 showing the spot at which two men were fishing. Number 2 the farthest rock out on the point at Deer Canyon, Ventura County. Below is the same scene when the tide came in and the sea whipped up. The fishermen were trapped at point 4, unable to get ashore. Number 5 is the farthest rock, or rather where it was located at low tide. Officers Nobel and Parr with Highway Foreman Cheeseman, threw a rope from point 3 to the men, a distance of 300 feet, and saved them.

May Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of May, 1931.

SIERRA COUNTY—Application 6948. William F. Biekel, c/o James D. Stewart, 138 Commercial St., Auburn, Calif., for 25 c.f.s. from unnamed springs and Mill Creek tributary to Little Canyon Creek, thence Canyon Creek and South Fork of Yuba River. To be diverted in Sec. 32, T. 21 N., R. 10 E., M. D. B. and M., for mining purposes.

MODOC & LASSEN COUNTIES—Application 6949. Big Valley Water Users Association by Peter Gerig and L. W. Kramer, Trustee, Bieber, Calif., for 500 c.f.s. from drainage, seepage and return water in Pit River from Hot Springs Valley Irrigation District tributary to Sacramento River. To be diverted everywhere along Pit River from the south line of Sec. 24, T. 40 N., R. 7 E., M. D. B. and M., to the west line of Sec. 14, T. 37 N., R. 7 E., M. D. E. and M., for irrigation and stock watering purposes (10,500 acres).

PLUMAS COUNTY—Application 6950. C. E. McGrath and R. L. Morgan, c/o C. E. McGrath, Greenville, Calif., for 2 c.f.s. from Echo Creek tributary to Rush Creek. To be diverted in Sec. 35, T. 26 N., R. 8 E., M. D. B. and M., for mining and domestic purposes.

LOS ANGELES COUNTY—Application 6951. Dr. Joseph A. Polia, 269 S. Lake St., at W. Miramar, Los Angeles, Calif., for 0.0001 c.f.s. or approximately 65 g.p.d. from an unnamed spring tributary to Mojave Desert. To be diverted in Sec. 1, T. 4 N., R. 10 W., S. B. B. and M., for irrigation and domestic purposes (1 acre).

SAN DIEGO COUNTY—Application 6952. Alice R. Hale Gaudin, Ramona, Calif., for 1 c.f.s. from an unnamed spring tributary to Dry Wash. To be diverted in Sec. 35, T. 43 S., R. 1 W., S. B. B. and M., for irrigation and domestic purposes (5 acres). Estimated cost \$500.

TRINITY COUNTY—Application 6953. L. E. Wheeler and W. W. McCumber, Burnt Ranch, Trinity County, Calif., for 1.0 c.f.s. from South Fork of East Fork of New River tributary to Trinity River. To be diverted in Sec. 7, T. 36 N., R. 12 W., M. D. B. and M., for mining purposes. Estimated cost \$700.

HUMBOLDT COUNTY—Application 6954. Peter H. Brandt, Fortuna, Calif., for 0.53 c.f.s. from Strong Creek tributary to Ed River. To be diverted in Sec. 2, T. 2 N., R. 1 W., H. B. and M., for irrigation purposes (15 acres). Estimated cost \$500.

SAN BERNARDINO COUNTY—Application 6955. William E. Wilson, 435 E. 19th St., Long Beach, Calif., for 0.1 c.f.s. from Fenner Springs (underground) tributary to Dry Sandy Wash. To be diverted in Sec. 28, T. 8 N., R. 18 E., S. B. B. and M., for mining and domestic purposes. Estimated cost \$3,760.

SAN BERNARDINO COUNTY—Application 6956. Wayne Courtney, 1318 W. 94th St., Los Angeles, Calif., for 8 c.f.s. from Arrastra Creek tributary to Lucerne Valley. To be diverted in Sec. 22, T. 3 N., R. 2 E., S. B. B. and M., for irrigation and domestic purposes.

SAN BERNARDINO COUNTY—Application 6957. Wayne Courtney, 1318 W. 94th St., Los Angeles, Calif., for 10 c.f.s., 7240 ac. ft. per annum from Baldwin Lake tributary to Lucerne Valley. To be diverted in Sec. 7, T. 2 N., R. 2 E., S. B. B. and M., for irrigation and domestic purposes (2000 acres). Estimated cost \$75,000.

SAN BERNARDINO COUNTY—Application 6958. Wayne Courtney, 1318 W. 94th St., Los Angeles, Calif., for 6 c.f.s. from Rattlesnake Canyon tributary to Lucerne Valley. To be diverted in Sec. 18, T. 3 N., R. 3 E., S. B. B. and M., for irrigation and domestic purposes.

SANTA CRUZ COUNTY—Application 6959. Maurice Bernstein, c/o G. A. Elliott, Eng., 1103-4 Merchants Exchange Bldg., San Francisco, Calif., for 1/6 c.f.s. from San Lorenzo River tributary to Pacific Ocean. To be diverted in Sec. 1, T. 9 S., R. 3 W., M. D. B. and M., for irrigation and domestic purposes (10 acres). Estimated cost \$3,000.

LAKE COUNTY—Application 6960. Oscar Terry

Boardman, Lakeport, Calif., for 1.0 c.f.s. from Scotts Creek tributary to Clear Lake. To be diverted in Sec. 12, T. 15 N., R. 10 W., M. D. B. and M., for irrigation purposes (32 acres). Estimated cost \$500.

MONO COUNTY—Application 6961. Rex M. Foster, Box 122, Bridgeport, Calif., for 0.110 c.f.s. from spring tributary to Green River. To be diverted in Sec. 23, T. 3 N., R. 24 E., M. D. B. and M., for power purposes (42 h.p.). Estimated cost \$25.

SAN BERNARDINO COUNTY—Application 6962. Gaylord, Lauder milk & Yaeckel, c/o G. B. Gaylord, P. O. Box 146, Claremont, Calif., for 0.05 c.f.s. from Cascade Canyon tributary to San Antonio Canyon. To be diverted in Sec. 31, T. 2 N., R. 7 W., S. B. B. and M., for mining purposes. Estimated cost \$100.

SAN JOAQUIN COUNTY—Application 6963. C. H. Wallace and R. A. Caswell, Rt. 4, Box 304, Modesto, Calif., for 8.94 c.f.s. from Stanislaus River tributary to San Joaquin River. To be diverted in Sec. 3, T. 3 S., R. 7 E., M. D. B. and M., for irrigation and domestic purposes (715 acres). Estimated cost \$4,000.

SAN BERNARDINO COUNTY—Application 6964. Robert M. Stapp, Lake Arrowhead, Calif., for 0.008 c.f.s. from unnamed spring tributary to Burnt Mill and Little Bear Creek. To be diverted in Sec. 28, T. 2 N., R. 3 W., S. B. B. and M., for recreational and domestic purposes. Estimated cost \$350.

SAN BERNARDINO COUNTY—Application 6965. Ralph P. Morrill, 4213 Halldale Ave., Los Angeles, Calif., for 400 g.p.d. from unnamed spring tributary to Lake Arrowhead. To be diverted in Sec. 20, T. 2 N., R. 3 W., S. B. B. and M., for domestic purposes. Estimated cost \$20.

SIERRA COUNTY—Application 6966. W. S. Coffin, Upland, Calif., for 3 c.f.s. from Rock Creek tributary to North Fork of Yuba River. To be diverted in Sec. 10, T. 19 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$600.

YUBA COUNTY—Application 6967. George W. Lischer, Comptonville, Yuba County, Calif., for 25 c.f.s. from Willow Creek tributary to North Fork of Yuba River. To be diverted in Sec. 26, T. 19 N., R. 8 E., M. D. B. and M., for mining and domestic purposes.

SAN DIEGO COUNTY—Application 6968. George L. Dodds, I. P. Janssen, F. L. Cox, H. F. Beauchamp and Maurice M. Myers, c/o George L. Dodds, Escondido, Calif., for 10 c.f.s. and 10,000 ac. ft. per annum from Escondido Creek tributary to Pacific Ocean. To be diverted in Sec. 3, T. 13 S., R. 3 W., S. B. B. and M., for irrigation and domestic purposes (about 7500 acres).

HUMBOLDT COUNTY—Application 6969. Dugald McKellar, Box 756, Eureka, Calif., for 0.025 c.f.s. from unnamed stream tributary to Humboldt Bay. To be diverted in Sec. 21, T. 5 N., R. 1 E., H. B. and M., for irrigation and domestic purposes (10 acres). Estimated cost \$20.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of May, 1931.

LOS ANGELES COUNTY—Permit 3697, Application 4048. City of Monrovia, Monrovia, Calif., May 1, 1931, for 1000 acre-feet per annum from Sawpit Canyon in Sec. 13, T. 1 N., R. 11 W., S. B., for municipal purposes.

LOS ANGELES COUNTY—Permit 3698, Application 5083. City of Monrovia, Monrovia, Calif., May 1, 1931, for 10 c.f.s. from Sawpit Canyon in Sec. 13, T. 1 N., R. 11 W., S. B. M., for municipal purposes.

LOS ANGELES COUNTY—Permit 3699, Application 5959. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.4 c.f.s. from 4 unnamed springs in Sec. 2, T. 3 N., R. 8 W., S. B., for domestic purposes. Estimated cost \$150,000.

LOS ANGELES COUNTY—Permit 3700, Application 5960. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.1 c.f.s. from four unnamed springs in Sec. 2, T. 3 N., R. 8 W., S. B., for domestic purposes.

SAN BERNARDINO & LOS ANGELES COUNTIES—Permit 3701, Application 5961. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.4 c.f.s. from two

Vital Statistics on Dam Construction

unnamed springs, Spring No. 43 in Sec. 19, T. 3 N., R. 7 W., S. B. and Spring No. 44 in Sec. 30, T. 3 N., R. 7 W., S. B., for domestic purposes. Estimated cost \$5,000.

LOS ANGELES COUNTY—Permit 3702, Application 5962. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 1.3 c.f.s. from seven unnamed springs, No. 6 in Sec. 3, T. 3 N., R. 8 W., S. B. and Nos. 7, 8, 10, 11, 12 and 13 in Sec. 33, T. 3 N., R. 8 W., S. B., for domestic purposes. Estimated cost \$100,000.

LOS ANGELES COUNTY—Permit 3703, Application 5963. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.325 c.f.s. from six unnamed springs in Secs. 34, 35 and 27, T. 4 N., R. 8 W., S. B. Estimated cost \$10,000.

LOS ANGELES COUNTY—Permit 3704, Application 5964. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.75 c.f.s. from two unnamed springs and Prairie Fork in Secs. 23, 22 and 15, T. 3 N., R. 8 W., S. B., for domestic purposes. Estimated cost \$20,000.

LOS ANGELES COUNTY—Permit 3705, Application 5965. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.61 c.f.s. from six unnamed springs in Secs. 23 and 29, T. 3 N., R. 8 W., S. B., for domestic purposes. Estimated cost \$28,000.

LOS ANGELES COUNTY—Permit 3706, Application 5966. County of Los Angeles, Los Angeles, Calif., May 2, 1931, for 0.1 c.f.s. from three unnamed springs in Sec. 21, T. 3 N., R. 9 W., S. B., for domestic purposes. Estimated cost \$30,000.

EL DORADO COUNTY—Permit 3707, Application 6859. Magnus Jensen, Camino, Calif., May 4, 1931, for 0.025 c.f.s. from Fill Canyon in Sec. 33, T. 11 N., R. 12 E., M. D. M., for irrigation on 3 acres. Estimated cost \$200.

LOS ANGELES COUNTY—Permit 3708, Application 6584. John J. Johnson, Sunland, Calif., May 4, 1931, for 0.055 c.f.s. from an unnamed spring in Sec. 2, T. 2 N., R. 14 W., S. B., for domestic and irrigation purposes on 83 acres. Estimated cost \$1,500.

MONTREY COUNTY—Permit 3709, Application 6318. Sidney W. Fish of New York City, New York, May 5, 1931, for 0.2 c.f.s. from San Jose Creek in Sec. 24, T. 16 S., R. 1 W., M. D., for irrigation and domestic purposes on 165 acres. Estimated cost \$12,500.

MONTREY COUNTY—Permit 3710, Application 6555. Sidney W. Fish, New York City, New York, May 5, 1931, for 0.5 c.f.s. from Palo Corona and tributaries in Sec. 5, T. 17 S., R. 1 E., M. D., for irrigation and domestic purposes on 165 acres.

EL DORADO COUNTY—Permit 3711, Application 6138. El Dorado Irrigation District, Placerville, Calif., May 6, 1931, for 5000 ac. ft. per annum from (1) North Webber Creek and (2) South Webber Creek in Secs. 18 and 21, T. 10 N., R. 12 E., M. D., for irrigation and domestic purposes on 30,702 acres. Estimated cost \$450,000.

TULARE COUNTY—Permit 3712, Application 6880. J. H. Garner, Springville, Calif., May 11, 1931, for 0.42 c.f.s. from Bear Creek in Sec. 3, T. 20 S., R. 30 E., M. D., for irrigation on 34 acres. Estimated cost \$500.

LASSEN COUNTY—Permit 3713, Application 6523. Antone Avilla, Bieber, Calif., May 13, 1931, for 1825 ac. ft. per annum from Juniper Creek in Sec. 3, T. 36 N., R. 8 E., M. D., for irrigation purposes on 996 acres. Estimated cost \$10,000.

SANTA BARBARA COUNTY—Permit 3714, Application 4552. B. F. Barca, Harrison, Calif., May 13, 1931, for 2 c.f.s. from unnamed well from underground source adjacent to Los Alamos Creek in Sec. 20, T. 8 N., R. 33 W., S. B., for irrigation purposes on 165.4 acres. Estimated cost \$4,000.

SISKIYOU COUNTY—Permit 3715, Application 6647. Bizzard Hill Mine, Inc., Sappo, Yuba, Calif., May 13, 1931, for 2.75 c.f.s. from Bizzard Creek in Sec. 4, T. 15 N., R. 7 E., H. B. M., for power purposes. Estimated cost \$2,000.

SANTA CRUZ COUNTY—Permit 3716, Application 6218. Santa Cruz Development Co., Santa Cruz, Calif., May 14, 1931, for 3.5 c.f.s. from West Branch of Branciforte Creek in Sec. 6, T. 11 S., R. 1 W., M. D.,

for irrigation and domestic purposes on 102.5 acres. Estimated cost \$100,000.

LASSEN COUNTY—Permit 3717, Application 6890. The Western Pacific Railroad Co., San Francisco, Calif., May 16, 1931, for 0.4 c.f.s. from Horse Creek in Sec. 15, T. 35 N., R. 7 E., M. D. M., for industrial and domestic purposes. Estimated cost \$16,700.

EL DORADO COUNTY—Permit 3718, Application 6817. H. A. Linthicum and W. D. Meyers, Roseville, Calif., May 27, 1931, for 400 g.p.d. from an unnamed stream in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

SAN DIEGO COUNTY—Permit 3719, Application 6893. Harry E. Cansey, Agnanga, Calif., May 28, 1931, for 7200 g.p.d. from an unnamed spring in Sec. 20, T. 9 S., R. 2 E., S. B. M., for irrigation and domestic purposes on 5 acres. Estimated cost \$300.

LOS ANGELES COUNTY—Permit 3720, Application 6882. Clarence A. and William H. Cruzan, Los Angeles, Calif., May 28, 1931, for 2 c.f.s. from (1) Warm Spring and (2) Whiskey Spring in Secs. (1) 4 and (2) 17, T. 5 N., R. 14 W., S. B., for mining purposes. Estimated cost \$5,000.

DAM APPLICATIONS, APPROVALS FOR MAY

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1931.

ALAMEDA COUNTY—Bowles Dam No. 592. Claremont Pines Corp., Beverly Hills, Calif., owner; earth, 38 feet above streambed with a storage capacity of 213 acre-feet, situated on West Branch tributary to Glen Echo Creek in Sec. 23, T. 11 N., R. 5 E., M. D. B. and M., for diversion purposes for mining, domestic and irrigation use.

MODOC COUNTY—Caldwell Lower Pit Dam No. 156-4. G. L. Kramer, Bieber, owner; crib and flashboards, 8 feet above streambed with a storage capacity of 60 acre-feet, situated on Pit River tributary to Sacramento in Sec. 33, T. 42 N., R. 10 E., M. D. B. and M., for diversion purposes for irrigation use.

MODOC COUNTY—Caldwell Upper Pit Dam No. 156-5. G. L. Kramer, Bieber, owner; crib and flashboards, 63 feet above streambed with a storage capacity of 40 acre-feet, situated on Pit River tributary to Sacramento in Sec. 34, T. 42 N., R. 10 E., M. D. B. and M., for diversion purposes, for irrigation use.

LASSEN COUNTY—Long Canyon Dam No. 244. Mr. John M. Hagata, Susanville, owner; earth dam, situated on Long Canyon in Sec. 7, T. 31 N., R. 13 E., M. D. B. and M.

SAN MATEO COUNTY—San Vicente Dam No. 615-2. Henry Cowell Lime & Cement Co., San Francisco, owner; earth dam, 19 feet above streambed with a storage capacity of 24 acre-feet, located in Corral de Tierra Palomares, for storage purposes, for irrigation use.

HUMBOLDT COUNTY—Camp Creek Dam No. 202. E. P. Hickey, Orleans, owner; log rock fill, 12 feet above streambed.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1931.

LASSEN COUNTY—Dry Lake Dam No. 253-4. Antone Avilla, Red Bluff, owner; earth, 15 feet above streambed with a storage capacity of 1825 acre-feet, situated on Juniper Creek tributary to Pit River in Sec. 3, T. 36 N., R. 9 E., M. D. B. and M., for storage purposes, for irrigation use. Estimated cost \$500, fees paid \$20.

NEVADA COUNTY—Lower Lindsay Dam No. 97-36. Pacific Gas and Electric Company, San Fran-

(Continued on next page.)

Auto Registration in State Shows Big Gain Over Same Period in 1930

DEPRESSION or no depression the Californian must ride.

At least that's the impression gained by a perusal of the latest report of the Division of Motor Vehicles, prepared by Col. Frank G. Snook, Chief of that Division.

The report presents the amazing fact that the total registration for 1931 as of May 1st, exceeds that of the same period last year by 42,109.

And of this total the number of pleasure cars and commercial vehicles under 3000 pounds has increased 28,936.

Colonel Snook draws attention to a general move among truck owners to replace solid tires with pneumatic. The increase in regis-

tration of trucks so equipped is 11,732 and 5134 in pneumatic tire trailers, against a decrease of 3890 in solid tire machines and 1059 in the same type trailer. The Division report continues:

"As of May 1st, the Division has issued 21,104 nonresident permits, which is 493 less than the number issued in 1930.

"During the last month arrangements have been made to open a new office for registration work at Hollywood.

"Plans have been started for new offices at Salinas, San Jose and Stockton, which will include adequate quarters for the traffic offices of the California Highway Patrol, as well as registration."

VITAL STATISTICS ON WATER RESOURCES

(Continued from page 37.)

cisco, owner; earth and rock dam, situated on Texas Creek tributary to South Yuba River in Sec. 20, T. 18 N., R. 12 E., M. D. B. and M.

SANTA CRUZ COUNTY—Molino Creek Dam No. 632. Coast Dairies and Land Company, Davenport, owner; earth, 24 feet above streambed with a storage capacity of 26.3 acre-feet, situated on Molino Creek tributary to Pacific Ocean in Rancho Agua Puerca Las Trancas, for storage purposes, for irrigation use. Estimated cost \$2,650, fees paid \$26.50.

ALAMEDA COUNTY—Upper Alameda Creek Diversion Dam No. 10-9. City and County of San Francisco owner; 32 feet above streambed with a storage capacity of 15 acre-feet, slab and buttress type, situated on Upper Alameda Creek tributary to Calaveras Creek in Sec. 17, T. 5 S., R. 2 E., M. D. B. and M., for diversion purposes, for municipal and domestic use. Estimated cost \$106,000, fees paid \$1,030.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of May, 1931.

SACRAMENTO COUNTY—Folsom Dam No. 97-56. Pacific Gas and Electric Company, San Francisco, owner; gravity, situated on American River tributary to Sacramento River in Sec. 24, T. 10 N., R. 7 E., M. D. B. and M.

LASSEN COUNTY—Long Canyon Dam No. 244. John M. Hagata, Susanville, owner; earth, situated on Long Canyon in Sec. 7, T. 31 N., R. 13 E., M. D. B. and M.

BUTTE COUNTY—Round Valley Dam No. 97-9. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on North Fork Feather River tributary to Feather River in Sec. 30, T. 26 N., R. 5 E., M. D. B. and M.

LOS ANGELES COUNTY—Big Santa Anita Dam No. 32-2. Los Angeles County Flood Control District, Los Angeles, owner; arch, situated on Big Santa Anita Creek tributary to San Gabriel River in Sec. 10, T. 1 N., R. 11 W., S. B. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of May, 1931.

AMADOR & CALAVERAS COUNTIES—Tiger Creek Afterbay Dam No. 97-105. Pacific Gas and Electric Company, San Francisco, owner; arch, 85 feet above streambed with a storage capacity of 3800 acre-feet, situated on North Fork tributary to Mokelumne in Sec. 23, T. 7 N., R. 13 E., M. D. B. and M., for diversion and regulation purpose for power use.

NEVADA COUNTY—Donner Creek Dam No. 311-7. Central Pacific Railway Company, San Francisco, owner; earth fill, 14 feet above streambed with a storage capacity of 140 acre-feet, situated on Donner Creek tributary to Truckee River in Sec. 16, T. 17 N., R. 16 E., M. D. B. and M., for storage and diversion purposes, for railroad use.

LOS ANGELES COUNTY—Chatsworth Highline Dam No. 6-32. City of Los Angeles, Los Angeles, owner; earth, 49 feet above streambed with a storage capacity of 230 acre-feet, situated on a wash tributary to Los Angeles River in Sec. 9, T. 2 N., R. 16 W., S. B. B. and M., for regulation and storage purposes, for irrigation and domestic use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of May, 1931.

LOS ANGELES COUNTY—Live Oak Dam No. 32-7. Los Angeles County Flood Control District, Los Angeles, owner; gravity arches, situated on Live Oak Creek tributary to San Jose Creek in Sec. 32, T. 1 N., R. 8 W., S. B. B. and M.

LOS ANGELES COUNTY—San Dimas Dam No. 32-10. Los Angeles County Flood Control District, Los Angeles, owner; gravity arch, situated on San Dimas Creek tributary to Fuddingstone Creek in Sec. 24, T. 1 N., R. 9 W., S. B. B. and M.

LOS ANGELES COUNTY—Sawpit Dam No. 32-12. Los Angeles County Flood Control District, Los

(Continued on page 44.)

Highway Patrolmen Praised

Courtesy to Motorists and Fairness in Arrests Are Cited in Letters

From John Stephen Zuckerman, Berkeley: Shades of Bill Hickock and Marshall Nix! The days of the "where the hell are you going" traffic officer seems to have passed forever, and in his place are courteous and efficient gentlemen. Surly and overbearing officiousness has been displayed by a real desire to aid the motorist.

I recently had the misfortune to have a rather bad accident between Coachello and Indio, California, and the promptness of the officers that patrol that territory in taking care of my car, and their politeness in helping us in every way possible was certainly gratifying. One of the officers, Ora E. Townsend, was especially efficient, courteous and helpful, and I wish to congratulate you in having such a fine man working for you. Under these circumstances, accidents become almost a pleasure.

With such men as this patrolling the State highways, I feel certain that the number of accidents will soon be minimized. More power to you!

* * *

ARREST IS PLEASURE

From Thomas O'Connor, San Diego: Recently one of our employees was arrested and fined for violation of a local ordinance.

I am taking this opportunity of commending the fairness and gentlemanly manners of the arresting officer, your Mr. Waite, No. 231, both at the time of arrest and in the courtroom. He is a credit to your splendid organization of officers, whose enforcement of the law must be trying enough at times.

* * *

EXAMPLE FOR OTHERS

From Arnold Klaus, Assistant Manager San Diego Chamber of Commerce: I wish to express the appreciation of the San Diego Chamber of Commerce Executive Board for the cooperation we received from you and Captain Otto Langer, of your patrol, in tendering to us the services of Mr. R. Schmoke, one of your motor officers in this division.

Mr. Schmoke proved to be a very excellent representative of your organization which is without par in this country. He proved his capabilities in many ways. First, by being consistently on the job; second, by being courteous and efficient in all his work; third, by his ability to meet people and obtain their good will, and fourth, by the capable way in which he presented the objects and purposes for which your organization is striving at the various dinners, when he was requested to take a part in the program.

I am sure that the group attending this National convention are envious of our California State Highway Patrol, and are doing everything in their power to see that a similar organization is created in their respective states. This I know is true of Texas, where their comparative division is eighteen months old, and in the newly organized Arkansas Patrol.

Child's Life Saved by Quick Work; Ventura Paper Lauds Training

From the *Ventura Free Press*.

First aid instruction, taught officers of the California Highway Patrol, yesterday was responsible for saving the life of Nancy Grosjean, 6, of 10632 Ayres avenue, Los Angeles, dragged to sea by a rip tide while bathing near Point Magu.

She was dragged from the water in an unconscious condition by her father Glenn M. Grosjean. Officer Joe Nobel of the California Highway Patrol, riding his beat on the Roosevelt highway, was summoned and administered first aid. He revived the child sufficiently to speed her to Oxnard where Officer Nobel and Austin Carpenter, member of the Oxnard fire department, applied a pulmotor and artificial respiration until the child was revived.

According to witnesses the child suffered a narrow escape and but for the timely arrival of the State patrolman possibly would have suffocated before a doctor could have been reached.

Officers of the patrol are given a thorough course in first aid to injured and drowned persons at the training course at Sacramento to which all officers of the patrol are now detailed. In addition to the State school course, all officers of the Ventura County patrol have received certificates of graduation from a course given Shell Oil Company employees here.

MARIN COUNTY OKEH

From Frank C. Sykes, State Board of Prison Directors: I could not let this opportunity go by without expressing to you the appreciation of President Neumiller, Warden Holohan, Parole Officer Ed. Whyte and myself for the courtesy shown us by three of your men in Marin County last night.

After spending two days and a night at the prison it was important that we reach San Francisco without being delayed, and thru the courtesy of Messrs. Wentworth, McClain and Monteverde we were greatly assisted in reaching the boat at Sausalito, thus avoiding a very long delay. It is a thing like this that makes a fellow feel that there are a few regular people left, and I intend to carry this message further. Let me congratulate you and your department in having such men with you.

* * *

AID IN EMERGENCY

From A. G. Dondero, San Francisco: On the night of May 8th I had some trouble with my car in the vicinity of Tracy, and I was assisted by officers A. L. Stuart and Clarence F. Brumbaugh to get to Tracy.

I wish to thank these gentlemen through you for their courtesy and civility.

If all your traffic officers are as courteous as these two gentlemen were to me on the night of my distress, I congratulate you.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
ERIC CULLENWARD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 JUNE, 1931 No. 6

State Wins Praise For Thoughtfulness

Santa Barbarans will be grateful to the State Highway Department for its trouble in working out a plan to save as many as possible of the fine poplar trees along the highway near Goleta.

This is one of the finest shaded lanes in the State and has attracted the attention of millions of visitors, and caused enthusiastic comment from every person who has ever driven beneath the stately branches of the unique collection of beautiful trees. They are practically the only ones of the kind in the State of California. Certainly there is no other grove so large.

Their destruction would have been a distinct loss to Santa Barbara and the county, as well as to the traveling public that has enjoyed them for so long. The decision to cut out only those that are dangerous and to take steps to prevent the others falling and injuring passing motorists is a thoughtful one on the part of the engineers of the State Highway Department, and is appreciated by the citizens generally.—*Santa Barbara Press*.

* * *

When a State Highway Department moves a strip of concrete that a historic landmark may be saved, the item is worthy of mention. The thing actually happened near San Miguel in San Luis Obispo County, where a two-story building stood on the right of way and in the path of destruction under plans to widen the road. When it was found the building could not be moved back the highway was rerouted a bit to the west and the old place still stands.—*Oakland Tribune*.

First came the "realtor," then the "mortician," later the "beautician," subsequently the "bootician," then the "pedicure." And the other day a large dump truck careened down the avenue in one of our large cities bearing the imposing legend: "Kelly & McGuire, truckologists."

Marriage and Trees

Now Highway Problem

L. H. Gibson, district highway engineer, with headquarters in San Luis Obispo, does not always need a map to see the point. Indeed, he's in training to become a horticulturalist, a tree expert, forester or something.

It seems his department was busy securing rights of way for a road in District Five. In dealing with one property owner, a lady, assurance was given that an old oak tree on the property being secured from her for road purposes would be preserved. However, in the written agreement the promise was covered in this verbiage:

"It is not contemplated that the live oak tree in front of your property will be removed."

The property owner lost no time in nailing that one. Back came a letter to Mr. Gibson couched as follows:

"You say that you do not 'contemplate' the removal of the tree. Well, I seriously contemplated being an old maid, but got married the first chance I got, so that, to ME, that clause in the contract contains no assurance at all."

Needless to say, the lady got her "iron-clad" assurance.

PILGRIMAGE WINS

O. K. OF GOVERNOR

Governor James Rolph, Jr., has approved the resolution adopted by both houses of the Legislature urging and requesting the heads of the various State departments to grant extended vacations with pay to all State employees who make the Pilgrimage to France sponsored by the Ninety-first Division Association.

The Pilgrimage leaves here on August 14th and returns on September 20th. It visits England, Belgium, Germany and France, and can be made for less than \$6000 on an all inclusive expense plan. The battlefields and the American cemeteries will be the objects of special visitation.

"SLOW THE SPEED, SPARE THE CHILD"

With hundreds of thousands of school children in California released from their classrooms for the summer vacation, the California Committee on Public Safety has devoted the month of June to a State-wide campaign urging upon motorists the need for special care in driving in order to minimize child traffic casualties. State and local traffic police cooperated in making the effort of the committee an effective one. The campaign is one of a series conducted monthly throughout the year, each designed to emphasize some particular phase of safe driving rules. The June subject was that of endangering the safety of children at play through speed or inattention. "Slow the speed and spare the child," was the slogan.

The real test of will power is to refrain from applying imaginary brakes when someone else is driving.

The difference between a cow chewing her cud and a flapper chewing her gum is that a cow always looks as if she were thinking.

Report of Activities

in the

Division of Water Resources

AS OF JUNE 1, 1931

EDWARD HYATT, Chief of Division

Irrigation District Activities



Applications for
Approval of
Dams

Flood Control and Reclamation



Bulletins Issued on
Water Resources
Study

Activities of the Division of Water Resources of the State Department of Public Works for the month of May give an official picture of the Water situation throughout the State. The division, headed by Edward Hyatt, reports as follows:

WATER RIGHTS

Twenty applications to appropriate water were received during April, eight applications were rejected and twenty-five were approved. Three permits were revoked and six licenses were issued.

Applications of particular note received during the month were two by Pacific Gas and Electric Company proposing the appropriation of a total of 170 cubic feet per second from the augmented flow of Bear River in Placer County for irrigation purposes; one by Consolidated Irrigation District proposing the appropriation of 1000 cubic feet per second and 200,000 acre feet per annum from San Joaquin River in Fresno County for irrigation purposes and one from California Oregon Power Company proposing an appropriation of 2000 cubic feet per second from Klamath River in Siskiyou County, for power purposes.

Among the permits which were issued was one to Paradise Irrigation District allowing an appropriation of 5000 acre feet per annum from Little West Branch of Feather River in Butte County for the irrigation of 11,100 acres at an estimated cost of \$362,000.

A permit of unusual importance was one issued to Frederick Bradshaw allowing an appropriation of 125 cubic feet per second from Horse Linto Creek in Humboldt County for mining purposes at an estimated cost of \$200,000.

Inspection of projects under permit has proceeded during the past month in Sacramento, San Joaquin, Tuolumne, Stanislaus, San Mateo, Santa Clara, Santa Cruz, and Monterey counties.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Case pending in the Superior Court of Shasta County, awaiting the Court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in Superior Court of Shasta County awaiting the Court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Division's report as referee submitted to the Superior Court on May first.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). More than eighty per cent of the water users have signed the stipulation for consent judgment which was presented at the conference held at Lake City on March 17, 1931. The stipulation is now being circulated among the non-resident parties.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted at the conference held at Cedarville on March 16, 1931.

Franklin Creek (Modoc County). Administration of the schedule of allotments for trial distribution during the 1931 irrigation season was continued throughout the month.

New Pine Creek (Modoc County). Field work on the investigation of the water supply and use of water on New Pine Creek was continued throughout the month.

WATER DISTRIBUTION

Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl and Soldier Creeks (Modoc County). Water master service on these streams was continued throughout the month.

Pine Creek (Modoc County). All water users on this stream have signed an agreement providing for water master service during the current season. Administration of the stream was commenced May 13.

Oak Run and Clover Creeks (Shasta County). Water master service was commenced on these streams for the current season about May 10.

North Cow Creek (Shasta County). Water master service was commenced on this stream for the current season on May 19.

Little Shasta River (Siskiyou County). Water master service on this stream was continued throughout the month.

DAMS

During May inspections have been continued on existing dams, many being inspected which have hitherto been inaccessible on account of their altitude. Frequent inspections have also been made on dams under construction and repairs.

Flood Control and Reclamation Details

Continued from preceding page.

To date, 760 applications for approval of existing dams are on file; 67 for approval of plans and specifications for construction or enlargement and 150 for approval of plans for repairs or alterations.

APPLICATIONS RECEIVED FOR CONSTRUCTION OR ENLARGEMENT

Dam	Owner	County
*Dry Lake	Antone Avilla	Lassen
**Lower Lindsey	Pacific Gas and Electric Co.	Nevada
**Molino Creek	Coast Dairies and Land Co.	Santa Cruz

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR REPAIR OR ALTERATIONS

Dam	Owner	County
Live Oak	L. A. County Flood Control Dist.	Los Angeles
San Dimas	L. A. County Flood Control Dist.	Los Angeles
Sawpit	L. A. County Flood Control Dist.	Los Angeles
Culbertson	Pacific Gas and Electric Co.	Nevada
Mammoth	Pacific Gas and Electric Co.	Placer
Folsom	Pacific Gas and Electric Co.	Sacramento
Round Valley	Pacific Gas and Electric Co.	Butte
Long Canyon	John M. Hagata	Lassen

PLANS APPROVED FOR CONSTRUCTION

Dam	Owner	County
Tiger Creek Afterbay	Pacific Gas and Electric Co.	Amador & Calaveras
Donner Creek	Central Pacific Railway	Nevada
Chatsworth Highline	City of Los Angeles	Los Angeles

PLANS APPROVED FOR REPAIR OR ALTERATIONS

Dam	Owner	County
Culbertson	Pacific Gas and Electric Co.	Nevada
Live Oak	L. A. County Flood Control Dist.	Los Angeles
San Dimas	L. A. County Flood Control Dist.	Los Angeles
Sawpit	L. A. County Flood Control Dist.	Los Angeles
Mammoth Reservoir	Pacific Gas and Electric Co.	Placer

ORDERS HAVE BEEN ISSUED AUTHORIZING USE OF THE FOLLOWING DAMS

Dam	Owner	County
Lake Madrone	Mansfield and McCallum	Butte
Salt Springs	Pacific Gas and Electric Co.	Amador & Calaveras

The Lake Madrone dam is an earth-fill dam built for recreational use in the foothills above Oroville.

The Salt Springs dam is a huge rock-fill structure built across the North Fork of the Mokelumne River and is part of the Pacific Gas and Electric Company's Electric System.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The maintenance force in Sutter County has been engaged in routine maintenance of structure, levees, canals and pumping plants. A small crew has been engaged in making fire breaks around the timber structures and in cutting noxious weeds. Emergency repairs are now being made on the Davis wier in the Sutter By-pass, at a cost of about \$4,000.

* New construction.

** Enlargement.

EMERGENCY FLOOD CONTROL AND RECTIFICATION OF RIVERS

Channel rectification work at the mouth of Little River in Humboldt County has been completed by the Hammond and Little River Redwood Company in cooperation with the State and Humboldt County.

FLOOD MEASUREMENTS AND GAGES

The gages maintained by this Division during the winter season have either been removed or transferred to other agencies for operation during the summer. The compilation of records for the flood seasons has been continued in the office, and reports will be issued shortly.

COOPERATIVE SNOW SURVEYS

Although the principal snow surveys as a basis for run-off estimates were made late in March and early in April and reported in the April 1st bulletin, additional surveys were made late in April and early in May at the key snow courses to furnish information for possible modification of earlier estimates and to indicate the extent of melting since April 1st. These later surveys complete the seasonal record of monthly surveys, February to May, for the key snow courses. In the May 1st bulletin the measured water content of the snow is given in per cent departure from the water content as shown by the April 1st surveys. This shows the extent of melting.

The snow surveys at the key courses showed a melting of the April 1st pack as measured at these courses, about as follows: Above 7500 elevation—Upper Sacramento and McCloud Basins (one course, Mt. Shasta) 25 per cent; Pit and Feather Basins (one course, Mt. Lassen) 4 per cent; American Basin (one course, Carson Pass) 34 per cent; Mokelumne Basin (one course, Blue Lakes) 63 per cent; Stanislaus Basin (one course, Lower Relief Valley) 45 per cent; Tuolumne and Merced Basins (average of six courses) 63 per cent; Upper San Joaquin Basin (one course, Kaiser Pass Meadows) 13 per cent; and Kings, Kaweah and Kern Basins (average of four courses) 68 per cent. The corresponding percentages of melting at practically the same courses in 1930 varied from zero to 48 per cent only. Below 7500 elevation—melting of 100 per cent at practically all courses.

The average precipitation to May 1st, in per cent of normal to May 1st, was about as follows for the various stream basins: Upper Sacramento, Pit, McCloud, Feather and Yuba, 58 per cent; American 60 per cent; Mokelumne, 64 per cent; Stanislaus, 72 per cent; Tuolumne, 65 per cent; Merced, 57 per cent; Mono, 57 per cent; Upper San Joaquin, 51 per cent; Owens, varying from 44 to 59 per cent; Kings, Kaweah and Kern, 62 per cent; and Los Angeles, San Gabriel and Santa Ana, from 65 to 80 per cent.

The lack of normal precipitation in April warranted a downward modification of the estimates given on April 1st for seasonal run-off. The estimated seasonal run-off for the Upper Sacramento

Rice Acreage Increase Shown in Report

(Continued from page 42.)

River was reduced to 34 per cent, or 2 per cent less than that of 1924; for the entire Sacramento Basin, including tributaries, the revised estimate was 30 per cent, or the same as 1924; and for the entire Sacramento-San Joaquin drainage including tributaries, 30 per cent, or 2 per cent above the 1924 percentage.

Work of the snow surveys for the next few months will consist, in the office, of computations to bring up long-time run-off estimates for the various stream flow stations selected to best reflect the snow run-off and all other compilations and studies necessary in determining completely the relation between precipitation, snow and run-off; in the field the usual contacts with the cooperative agencies in effecting the plans for next year's surveys and such work as may be necessary in gradually extending the scope of the surveys as funds permit. A conference was held at Yosemite on May 16th to go over the results during the past season in the Merced and Tuolumne Basins and to consider certain extensions in future work.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The salinity sampling in the Sacramento-San Joaquin Delta has continued at the thirty stations previously maintained, with fourteen stations added during the month. The additional stations are added as necessary to keep well in advance of the seasonal salinity encroachment. A check has been made of the rice acreage under river diversions above Sacramento. This shows an increase of 26 per cent over the rice acreage of 1930 which was practically the same acreage as in 1924. In the area above Colusa, the present season's rice acreage is 34 per cent greater than the acreage of 1924. This indicates very definitely that conditions probably worse than those of 1924 are to be anticipated. The accompanying table gives comparative stream flow data for 1931 and 1924. The recent salinity tests are also shown. No comparison can be given with the 1924 salinity as the stations were not established in 1924 until the later part of May.

Within the last few days the river has dropped very rapidly above Sacramento and further measures for conservation and control will soon be required. In view of this situation an early meeting of the Permanent Committee of the Sacramento-San Joaquin River Problems Conference has been called. As one measure, the possibility of a patrol of the upriver area to effect a reduction in river diversions to the extent of controllable wastes, is to be considered.

The following are comparative stream flow data for 1931, as against 1924:

Station	Discharge in Sec. Ft.	
	1931	1924
Sacramento River at Red Bluff	5/17 3630	5/17 3240
Sacramento River at Verona	5/22 2250	
Sacramento River at Sacramento	5/22 2975	5/22 2980
American River at H Street Bridge	5/22 1050	5/22 1130

Station	Discharge in Sec. Ft.	
	1931	1924
San Joaquin River near Vernalis	5/21 470	5/21 1120
Combined flow of Sacramento River at Sacramento and San Joaquin River near Vernalis	5/21 3980	5/21 5100

Recent Salinity Tests in the Sacramento-San Joaquin Delta show:

Station	Salinity in parts of chlorine per 100,000	
	5/6/31	5/10/31
Bullhead Point	1050	900
O and A Ferry	360	
Collinsville	299	166
Emmation	5	4
Three Mile Slough Bridge	7	3
Antioch	144	88
Jersey	38	6
Webb Pump		6

WATER RESOURCES

Napa Valley Investigation.—Measurements of stream flow on Napa River, Dry Creek, Conn Creek and Rector Creek were made during the month and data were obtained with respect to diversions to establish the facts relative to percolation losses, accretions, and the water crop. In addition thereto a selected group of 15 wells was gaged.

Preliminary investigation of streams for reservoir sites was completed from which it appears that only two sites—aside from known and hitherto explored sites on Conn Creek, Rector Creek, and Milliken Creek—offer any promise. These sites are located on Taplin Ranch about two or three miles east of St. Helena and on Dry Creek. These sites are relatively small, but would appear to justify further exploration and survey whenever storage of flood waters becomes of importance.

Ventura County Investigation.—This investigation has continued in a routine way. A special feature, however, was involved in that an investigation of possible reservoir sites on Piru Creek was made to determine whether the location of the new State highway will interfere with conservation of the waters of the creek. The proposed highway passes through two of the reservoir sites on the creek, but an additional reservoir was found several miles below where no interference with the highway could occur. At this site it is possible completely to conserve the waters of the creek, provided that drilling of the dam site discloses favorable conditions. The tentative conclusion of the geologist examining the site is favorable, but this of course might be changed by drilling explorations.

WATER RESOURCES REPORTS

Satisfactory progress has been made in completing the reports on the water resources investigations covering the State Water Plan for the coordination, development, conservation and utilization of the

Irrigationists Limit Amount of Water Used to Overcome Shortage

(Continued from page 43.)

water resources of the State, authorized under the provisions of Chapter 832 of the Statutes of 1929. The following bulletins are nearing completion and it is expected that the finished plates and texts for these publications can be placed in the hands of the State Printer during the latter part of June for publication.

Bulletin 26, "Sacramento River Basin."

Bulletin 27, "Salinity Control in Sacramento-San Joaquin Delta and Upper San Francisco Bay."

Bulletin 28, "Economic Aspects of a Salt Water Barrier Below Confluence with Sacramento and San Joaquin Rivers."

Bulletin 29, "San Joaquin River Basin."

MISCELLANEOUS ACTIVITIES

A study is being made to determine the acreage in the Delta riparian to the San Joaquin and Mokelumne Rivers and connecting channels. This study corresponds to the recent investigation made of the acreage riparian to the Sacramento River.

IRRIGATION

Compilation and preparation of data for the 1930 report on the activities of California irrigation districts have been completed and plans are being made for the publication of the report.

Office conferences have been held with a number of Sutter County orchardists who are now irrigating from wells and are looking forward to a means of supplementing their rapidly diminishing water supply.

Field visits were made and conferences held with officials of the Grenada, Big Springs and Montague irrigation districts, located in Siskiyou County, for the purpose of discussing matters connected with the economic operation of these districts.

An inspection was made of construction work in progress in the El Nido irrigation district located in Merced County. A preliminary investigation, general in character, has been made of the water situation in the orchard districts of Sutter County.

Owing to the serious water shortages which will be faced this season by nearly all the irrigation enterprises in the central and northern parts of the State, the directors and managers of irrigation districts are attempting to limit the use of water to the least amount that will mature crops.

At a meeting of the California Bond Certification Commission held on May 6, at Sacramento, action was taken on matters relating to irrigation districts as follows:

Grenada Irrigation District—Plan presented for reorganization and refinancing, approved.

Lindsay Strathmore Irrigation District—Agreement for the purchase of 200 shares of stock in the Peoples Ditch Company, approved.

Paradise Irrigation District—Transfer of \$6,742 from the construction fund to the general fund of the district, approved.

First Quarter of 1931 Opens With Greater Death Toll

CALIFORNIA motor vehicle deaths in March total 196 bringing the total for the first three months of 1931 to 566, according to a report received by Superintendent E. Raymond Cato from the Bureau of Research, Statistics and Traffic Safety of the California Highway Patrol.

The total of 566 deaths for the first quarter of 1931 is 8.42 per cent *greater* than the total for the corresponding period of 1930. This is a marked contrast to the first quarter of 1930, the total of which was 1.32 per cent *less* than the total for the first quarter of 1929.

The numerical increase of deaths in March this year over March last year was 26 or 15.29 per cent.

The report further states that in addition to the 196 persons killed in March, 3781 were injured in the 2708 accidents reported for the month.

VITAL STATISTICS ON WATER RESOURCES

(Continued from page 38.)

Angeles, owner; arch, situated on Sawpit Creek tributary to San Gabriel River in Sec. 13, T. 1 N., R. 11 W., S. E. E. and M.

PLACER COUNTY—Mammoth Reservoir No. 97-39, Pacific Gas and Electric Company, San Francisco, owner; earth, located in Sec. 12, T. 11 N., R. 7 E., M. D. B. and M.

SACRAMENTO COUNTY—Folsom Dam No. 97-56, Pacific Gas and Electric Company, San Francisco, owner; gravity, situated on American River tributary to Sacramento River in Sec. 24, T. 10 N., R. 7 E., M. D. B. and M.

CORRECTION

In the May publication of CALIFORNIA HIGHWAYS AND PUBLIC WORKS there appeared a tabulation of the Construction Record for 1930. Under the subtitle Road Oil Mix, there appeared a statement crediting E. A. Wolfe with being the resident engineer on a road job in Del Norte County with Paul Steenstrup as street assistant. This was a mistake in department records since Mr. Steenstrup was the resident engineer.

Matters now pending before the Commission which will receive consideration in the near future are:

Scott Valley Irrigation District—Request for approval of a refunding bond issue.

Linden Irrigation District—Consideration of protests against approval of a proposed bond issue.

Corcoran Irrigation District—Request for approval of an agreement between the district and Meridian Limited, a corporation, for the lease of certain wells and pumping equipment to be installed by the corporation on its own lands within the district.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HIERZ-----Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

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TIMOTHY A. REARDON, San Francisco
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T. E. STANTON, Materials and Research Engineer
FRED J. GRUMM, Engineer of Surveys and Plans
C. S. POPE, Construction Engineer
T. H. DENNIS, Maintenance Engineer
CHAS. E. ANDREW, Bridge Engineer
R. H. STALNAKER, Equipment Engineer
E. R. HIGGINS, Chief Accountant

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F. G. SOMNER, District IX, Bishop
R. E. PIERCE, District X, Sacramento
General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

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J. J. HALEY, Jr., Administrative Assistant
HAROLD CONKLING, Deputy in Charge Water Rights
A. D. EDMONSTON, Deputy in Charge Water
Resources Investigation
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Rights

A. N. BURCH, Irrigation Investigations
H. M. STAFFORD, Sacramento-San Joaquin Water
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GORDON ZANDER, Adjudication, Water Distribution
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C. H. KROMER, Structural Engineer
CARLETON PIERSON, Specification Writer
C. O. PALM, Chief Clerk
C. E. BERG, Engineer, Estimates and Costs
J. W. DUTTON, General Superintendent Construction
W. H. ROCKINGHAM, Mechanical Engineer
C. A. HENDERLONG, Assistant Mechanical Engineer
W. M. CALLAHAN, Electrical Engineer

DIVISION OF MOTOR VEHICLES

FRANK G. SNOOK, Chief
E. RAYMOND CATO, Superintendent of California
Highway Patrol

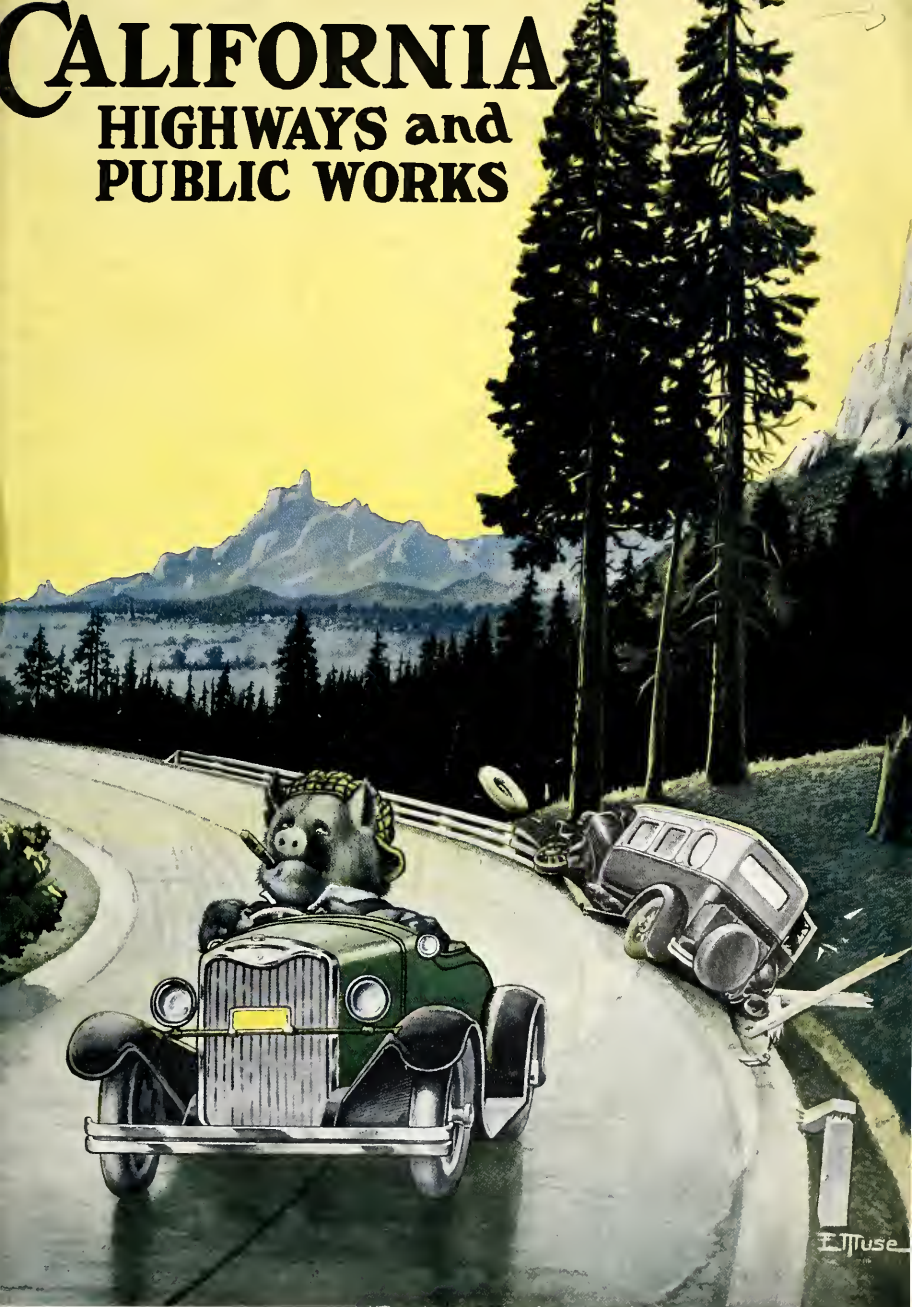
DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor
Port of San Jose—Not appointed
Port of San Diego—Edwin P. Sample

CALIFORNIA HIGHWAYS and PUBLIC WORKS





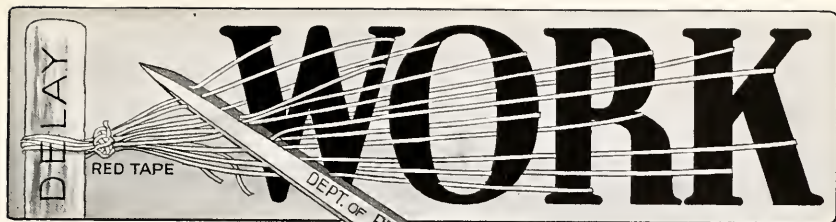


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SIX MILLION DOLLARS worth of contracts are to be awarded by the Department of Public Works during the next three months for highway work!

And the total contracts under way on July 1st amounted to \$17,522,969.

The total number of men employed by the Highway Division on that date was 6261.

Thus does the Department of Public Works enter the third quarter of the year with expectation of awarding additional contracts of \$2,726,500 and bringing the total for the period to the not insignificant sum of \$8,726,500.

GOES TO LABOR

Seventy per cent of this expenditure is passed on to labor.

The Division of Architecture is shaping its work so that additional employment may be given 1700 men during the July-September period. Already 2042 are at work on various projects.

Awards already made total \$5,868,010 for 100 projects. Those to be undertaken during July, August and September call for an estimated cost of \$4,858,273, involving 69 projects.

Thus it is shown that the two divisions alone will employ more than 9000 men!

LARGE INCREASE

Activities of the Division of Water Resources are largely technical, but this service comprehends work costing \$1,658,000. The regular staff of 250 trained men represents a considerable increase, made necessary by the expanding services of the division.

Summing up, the Department of Public Works is right up to its schedule of activities, drawn up under Governor Rolph's program for speeding up public improvements as a means of alleviating unemployment.

Nor must the fact be lost sight of that the employment of more than 9000 men on State projects does not nearly represent the total given work under this speeding-up

process. Considerable labor is necessary in preparing materials and machinery to be used on contracts let by the various divisions.

ENFORCE NEW LAWS

While it is impossible accurately to estimate how many are so employed, it should be noted that the Department is preparing strictly to enforce the provisions of the two so-called labor bills passed at the last session of the Legislature and signed by the Governor. One of these, Chapter 398, Statutes of 1931, provides that **NONE BUT AMERICAN CITIZENS MAY BE EMPLOYED ON STATE PROJECTS** unless in the event of extraordinary emergency. The other, Chapter 397, Statutes of 1931, assures the worker payment of **NOT LESS THAN THE GENERAL PREVAILING RATE OF WAGES** on public works.

Some idea of the work planned by the Highway Division from July to December may be gleaned from the following table, which is an estimate of the jobs to be done, although it shows the jobs which it is proposed will be advertised up until December 31st. Perusal of this list will show that the work is distributed over the entire State, thus giving employment in every section.

PROPOSED WORK

Road	Limits	Amount
I-Men—Cedar Creek and Dann Creek bridges	-----	\$284,000
V-Mon—Rocky Creek to Divide	-----	311,500
VI-Mad—At Madera	-----	40,500
II-Sha—Clear Creek approaches	-----	9,100
V-SBt—S. boundary to San Benito River	-----	344,600
IV-SM-SCL—Redwood City to Oregon Ave.	-----	561,400
IV-Ala—Greenville to Livermore	-----	166,100
II-Las—Willards to Susanville	-----	253,000
III-Gle—In Willows	-----	25,700
III-Pla—Lincoln to Sheridan	-----	54,700
VII-Ora—Fullerton to westerly boundary	-----	158,800
V-SBt—San Benito River bridge	-----	146,000
VI-Mer—Bridges	-----	40,000

(Continued on page 22.)

State Agencies Welded into Unit In Intensive Forest Fire Battle

THAT right now is the time to start improving the State fire laws by uniting all industrial and commercial interests and tying the fire situation into the big problem—the water problem of the State—was the key message given the California Fire Emergency Committee at its first executive session, July 1, at the State Capitol, by Roland A Vandegrift, Director of Finance.

"We know," said the Director of Finance, speaking on the administration's policy of forest protection, "there will always be the necessity for spending money for forest fire suppression, and of course the best method of suppression is prevention. We listened to State Forester M. B. Pratt and other gentlemen who are particularly concerned, and I believe that we can say without fear of contradiction that the State of California is now and will be, as a result of the budget, in a better position to protect the forests and the other property in the State from fire than ever before."

ADVANCES CAMPAIGN

Vandegrift's talk, according to actual fire fighters present, not only advanced 25 years' efforts of fire prevention endeavors in California to a workable basis as long visioned by fire organizations, but also visualized a solution of the problem through the medium of such a constituted body as the California Fire Emergency Committee.

It is claimed by fire prevention leaders that Vandegrift's visualization of the fire problem as (1) a coordinated State project, (2) to become a major factor in the State's water problem, and (3) to be covered by adequate State legislation for enforcement purposes, properly installs all fire plans into the industrial development and preservation of the natural resources of the State, thereby converting the whole problem from a seasonal menace into a State economic measure of real value.

ROLPH'S MESSAGE

Unanimously supporting the contentions of the Director of Finance, the committee named three of its members as a subcommittee to study remedial legislation covering fire pre-

vention and suppression. The subcommittee consists of R. A Vandegrift, chairman; State Fire Marshal Jay Stevens and Superintendent E. Raymond Cato of the Highway Patrol.

"The presence of the members of the California Fire Emergency Committee here today is of great significance," said Governor James Rolph, Jr., in opening the executive session he had sponsored. "It means that the State government is solidly back of the preservation of California's greatest heritage—its forests and watersheds."

After reviewing the purposes for convening the session, in closing his talk to the committee, Governor Rolph said: "Now is the time for California to recognize squarely and fully its responsibility in forestry. We must search for the facts and upon these facts build a program of development which can be carried out progressively as rapidly as sound public finance permits."

COOPERATIVE AGENCIES

As executive secretary of the committee, State Forester M. B. Pratt outlined the activities of the nine distinct fire prevention campaigns being carried on in the State by cooperative agencies to the Governor's proclamation.

As a coordinating body, the California Fire Emergency Committee is expending no State funds on the consolidated fire prevention campaign this season. The costs of the campaign are contributed by the cooperative agencies.

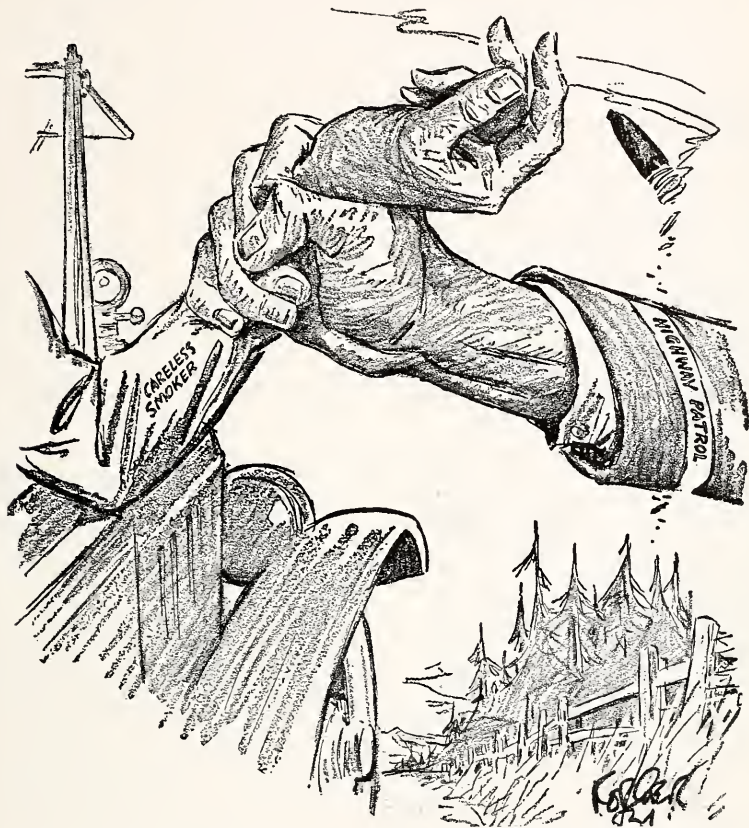
In addition to the State Division of Forestry and the U. S. Forest Service, fire prevention campaigns are being conducted by the "Stop Forest Fires" Committee, the State Chamber of Commerce, the California Forest Protective Association, the California State Automobile Association, the Automobile Association of Southern California, the American Legion and the Conservation Association of Los Angeles County.

COORDINATED REPORTS

With an attendance of 15 out of 17 members listed in the proclamation, the major portion of the session was devoted to receiving reports of accomplishment from the coordinated State forces.

GIVE THEM THE CURE

By Rodger



State Forester M. B. Pratt and members of Governor Rolph's emergency committee have acted with commendable promptness to cope with the forest fire problem, which is more serious than ever this year because of the extraordinary light seasonal rains.

Recognizing the fact that many of the fires that are turning California's famed forests into wastes of burnt stumps are started by careless campers and motorists, the State Highway Patrol has been ordered to exercise special vigilance in making arrests for violation of fire prevention laws.

It may not be generally known, but the state law prohibits the flicking of lighted matches, cigarets and cigars from automobiles and is even more stringent in dealing with campers who fail to put out all flaming substances when breaking up camp.

The punishment following conviction may be a term in jail or a fine or both.

Supt. Cato of the patrol has assured the emergency committee that his men will not hesitate to make arrests, and is making an appeal to the courts for cooperation.

It is a matter of general knowledge that the courts in the past have dealt lightly with this type of offender.

The News has no disposition to "pull the law" on anyone. But in view of the seriousness of the situation we can see no reason why the courts should not mete out the penalties prescribed by law to those who despoil our forests.

Cooperation between the enforcement officers, and the courts, in our opinion, will reduce forest fires to a minimum.—(S. F. Daily News, June 8)

Highways First Line of Defense In Fire; Man Power Mobilized

How the Department of Public Works is making the State highways of California a natural firebreak as a means of reducing the annual toll of devastation taken each year, is told in Colonel Walter E. Garrison's report to the State Fire Emergency Committee. The report, read to the committee July 1st, follows in part:

THE department has made immediate response to the Governor's call for aid in fighting fires.

The entire man power and equipment of the department has been made ready for the field. Regular employees came first, then contractors engaged in highway work were advised that under the regulations, specifications and contracts their crews were subject to service in fighting fires.

The highway employees, motor patrolmen and contractors' crews numbered more than 3500 when the call went out.

PLAYS MAJOR PART

Now with the construction program in full swing, man power has increased to nearly 5000 and the distribution of these forces at various points in the State makes possible a quick service at any point. So, in cooperation with the Federal Forest Service and the Department of Natural Resources, the Division of Highways is able to play a major part.

In human ills, prevention is better than cure. It is equally true that the fire prevented is the only costless one. It is better business to prevent fires than to arrest them after they have taken their toll on public and private property.

The Department of Public Works has a definite program of service in reducing the fire hazard. Work of prevention is accepted as a function of the department and it is under way for several months each year.

SPRAY AND BURN

The 1931 program of the Division of Highways provides for spraying and burning roadside vegetation over 46 counties. It covers 1150 miles and represents an expenditure of \$81,000. Supplementing this is the work done in fall and winter months in the forest areas. Growths encroaching on the rights of way are burned with an annual cost of about \$20,000. More has been done this year—thanks to the emergency appropriations to relieve unemployment.

Burning of growths and vegetation along highways and rights of way was at one time regarded as an act of good housekeeping. The clean road pleased the eye. It continues to do so, but a decidedly more practical object now is sought.

This is a dry year. The State roads thread seared valleys and dry mountain roads. The work of oil spraying rights of way and burning them over and the clearing of dry brush from hill roads does two things. It removes the hazard latent on the roads and the cleared rights of way provide thoroughly effective firebreaks.

HIGHWAY A DEFENSE

Fires must not start on highways. Fires started elsewhere must stop at highways. Thus a hazard is removed and an aid to safety established.

It is not too much to say that the State highway system already has become a first line of defense against fires and will be improved yearly in this service.

If motorists using the highways and campers who go into the forests will only exercise known and obvious precautions, their contribution to the safety of lives and property will be a material one.

Work of clearing the highways is carefully planned and the plan works. Early in the season the most hazardous areas on the more than 3000 miles of highways, with nearly 700 miles in the worst forest section areas, were scouted and mapped.

UTMOST PRECAUTION

A strip nine feet wide along both sides of the right of way is sprayed with oil and early burning begun under every known precaution to prevent the spread of fire. In addition to ordinary tools for service, the men are equipped with Hauke torches and Indian type knapsack pumps. Each crew is attended by a water tank or fire truck, sentinels are posted at control points to protect traffic and the utmost care is exercised to protect trees, fences and inflammable property.

Inflammable Matter Along Rights of Way Sprayed and Burned

It is understood, of course, that only the most hazardous places are selected for protective treatment, but even under this limitation the range of the year's work, now well accomplished, includes 1150 miles in areas distributed as follows:

Along the Redwood Highway in Marin, Sonoma, Mendocino and Humboldt counties; the Pacific Highway east and west of the Sacramento River to Redding, as well as scattered sections totaling perhaps 25 miles between Redding and the State line; portions of the Tahoe-Ukiah route; between Roseville, Auburn and Grass Valley.

WIDESPREAD FRONT

The Mother Lode from Auburn to Sonoma; the mountain laterals, between Sacramento and Placerville, Clay and Jackson, Lodi and San Andreas; the all-year highway between Merced and Yosemite; the inland coast laterals, Gilroy to Califa, San Lucas to Hanford, and Santa Maria to Maricopa; the main line from Sacramento to Napa; the river lateral from Lodi to Suisun, Martinez to Richmond; the valley route from Sacramento to Bakersfield; the ridge route, Bakersfield to Los Angeles; and the coast route from San Francisco to San Diego. Work will also be done in San Diego, San Bernardino and Orange counties.

The subject of fire prevention is one of such scope as to make its detailed review impossible in a brief report, but, summarized, it may be said:

The highway system of California is becoming a first line of defense against the spread of forest and vegetation fires.

ASSURE COOPERATION

The Division of Highways is doing annually a work of highest value in fire prevention.

The Division of Highways as a cooperating unit is effective in the field both because of its superior numbers in man power and because of its distribution of men and equipment.

Associated agencies may be assured of cooperation and assistance promptly and to the full measure of the department's resources.

*Life to the Forest,
Life to the Tree;
Fire prevention—
That is the Key.*



\$100 SMILE THIS—She's Helen Nonam and that's the slogan above her picture, for writing which she received the check she holds. A student of Herbert Hoover High School, Glendale, Miss Helen won first prize in a contest conducted by the Stop Forest Fires Committee of California. Why shouldn't she smile?

COMMUNITY SPENDING

Forty-eight California counties spent a total of \$1,609,506.37 for advertising and promotion in 1930, a report issued by State Controller Ray L. Riley reveals. Mr. Riley figures the per capita cost at 30 cents. Los Angeles County was the largest single advertiser, spending \$954,297. San Francisco spent \$140,000, Alameda County \$104,779, and Riverside County \$59,786.

Uncle Sam has in his postal service alone, a total of 77,585 automobiles.

Experiments Prove Radio's Worth In Broadcasting Orders to Police

By JAMES ROCHE, Inspector in Charge, Bureau of Communication

“HELLO! This is border patrol office at ----- speaking. Please stand by and receive report on murderer somewhere on the California highway, heavily armed and driving a stolen auto.”

That might be a message sent through to all highway patrolmen in the near future should present plans for a State-wide radio system for the California Highway Patrol come into being.

The project calls for several low wave length stations throughout the State, the broadcasts from which will not interfere with regular radio programs, since the broadcast wave would be beyond the reach of commercial receivers.

START MAN HUNT

Installation of radio sets in border checking stations would completely shut off all auto entrances and exits and, with receivers located in patrol offices and on patrol cars and motorcycles, it is not hard to picture a conversation like that above being the signal for an intensive man hunt on the part of the Highway Patrol.

It has been my duty to inspect the radio systems of the San Francisco, Berkeley and Los Angeles police departments; the Boeing Aircraft and the Radio Corporation of America systems; the equipment of the Western Electric Company and the plan employed by the Department of Forestry. Consequently I am most enthusiastic over the possibilities of such means of communication for the Highway Patrol.

TALK TO CAPTAINS

A unique experiment was tried during the last class of captains, then in session at the Sacramento training school. Chief Cato talked over the air directly to the school several miles away, by means of the Boeing aircraft transmitter. He outlined to the assembled captains the policies and duties of the patrol and was heard clearly. I also had the pleasure of addressing the officers on “Communication and Radio” and was grateful to learn subsequently that the county captains are enthusiastic over this modern method of crime broadcasting.

Further tests at headquarters in Sacramento have demonstrated the feasibility of the system. A low wave length receiver was installed at Eleventh and P streets and we were able to listen in on the different police department radio broadcasts throughout the State—in some instances we heard other states as well.

Intensely interesting examples of the efficiency of police broadcasting were picked up by us in Sacramento. One in particular came from Los Angeles. We heard radio headquarters there order two patrol cars to a burglary assignment. A few minutes later we listened in as one was instructed to return to its regular beat since the other had apprehended the thieves.

WOULD AID PATROL

In passing it might be noted that Los Angeles police have increased their felony convictions 60 per cent since the installation of radio equipment. Chicago sends out an average of 3000 calls per day via low wave.

The value of this system for the California Highway Patrol will be readily recognized. Our men are spread over every strategic center of the State. Not only would our efficiency in patrolling the highways be improved; our record of cooperation with other police agencies in the apprehension of criminals enhanced; our effectiveness in time of emergency or disaster increased, but—we would go far in aiding in keeping criminals out of the boundaries of this State.

SPARE OUR BLUSHES

THE TRIP from Sacramento to Lake Tahoe by way of Auburn can be made easily in four hours without getting the automobile dusty, due to the splendid condition of the new road to the Donner summit.

* * *

THE SUMMIT GRADE from the valley side isn't anywhere near as formidable as before, and not as difficult to make as the return trip up from Donner lake to the top.

* * *

THE HIGHWAY WORK on both sides of the summit is the finest mountain road that exists anywhere this writer has been. If accidents occur there they are the fault of the drivers and not of the engineers and workmen who laid out the roadway.—(From C. J. L.'s column “Sacramento” in *Sacramento Union*, June 29th.)



EVERY SECOND COUNTS in catching a criminal. And the Highway Patrol does not wish to be caught napping. So E. Raymond Cato, the Chief, is experimenting with radio communication for his force. He sent out his first message the other day to officers in the training school, being guided over the "air bumps" by James Roche, Inspector in Charge of Communications. To use the old Amos and Andy signal: "Here they are."

Warm tribute to the tireless and successful efforts of the men of the Highway Patrol to keep traffic moving and accidents at a minimum during the July 4th double holiday has been paid by Chief Cato in a general order.

It follows:

"I desire to commend the entire personnel of the California Highway Patrol for their tireless energy and the splendid devotion to

duty shown by them during the strenuous days and nights of July 3d, 4th and 5th.

"Through your vigilance and activity the hundreds of thousands of California citizens and guests were able to enjoy our highways in safety, for, even though the highways were crowded with vehicles, never before exceeded in numbers, fatal accidents were few.

"Men, I am proud of the record you made and proud of you."

Patrolman Dazzles Man With Flashlight, Disarms, Arrests Him

COOLNESS under attack and extreme bravery were displayed last month by William C. Fouyer, member of the California Highway Patrol, who, covered with a pistol by an alleged auto thief, dazzled the man with his flashlight, disarmed and arrested him.

The story of Fouyer's quick wit is told in a story appearing in the *Morning Union* of Grass Valley under date of June 21. It follows:

Displaying plenty of cool nerve in facing an asserted Moline, Ill., gunman, Officer William Fouyer of the California Highway Patrol, outwitted George Helta at Floriston at 9:30 o'clock Friday night and landed him in the Truckee jail. Helta was captured after a wide-open chase down the River Highway from Truckee to Floriston.

ONE SHOT FIRED

Helta, it is claimed, broke into a car in Truckee and stole a revolver. Securing a ride to Lake Tahoe with a motorist "Good Samaritan," the asserted gunman forced the car driver to stop his machine, give up his valuables and also his car. One shot was fired to enforce the demands.

The car motorist was given a ride to Truckee by a passing motorist, and, while relating his story to Fouyer, recognized his machine going through town. Fouyer instantly gave chase, and when the bandit refused to stop forced the machine into the ditch. Helta jumped from his car and leveled his gun at the officer.

DAZZLES ASSAILANT

Fouyer was more quick witted, and placing his spot light on Helta jumped into the shadows and drew his own gun, calling upon Helta to drop his gun or take a charge of lead. Helta threw his revolver over the embankment and submitted to arrest and handcuffs.

Fouyer also recovered the car, the bandit's gun, and placed the man in the Truckee jail. He was taken to Auburn to face the serious charges of highway robbery with a deadly weapon.

COURTEOUS WARNING

From Chas. J. Carter, San Francisco: I respectfully wish to report that, during the enforcement of his duties, Officer Torres of San Jose found it necessary to warn the writer with respect to traffic regulations, and, in the course of such duty, exercised such unlooked for and unusual courtesy and politeness, together with a kindly attitude unsurpassed in pointing out a proper and legal observance of the laws relating to motorists' rights and what-not, that I feel it incumbent upon me, as a citizen, to acquaint you with the foregoing data.

In these days of haste and thoughtlessness, it is a great pleasure to realize that your department is so ably represented by such competent and wholly human officers as Mr. Torres, and other gentlemen in the Traffic Division whom I have met.

Louisiana to Lead U. S. in Cash Spent Upon Highway Work

REPORTS from forty-five of the forty-eight states indicate that the 1931 highway construction program will far surpass the amount of work accomplished in 1930, according to a statement by D. H. Lafferty, president of the California State Automobile Association.

"The sum of one billion dollars, in round numbers, will be spent by the states for improving some 40,000 miles of highways and in maintaining the existing systems," Lafferty said. "In addition, there will be about \$500,000,000 expended by counties on local roads.

LOUISIANA LEADS

"On the basis of reports received, Louisiana will head the list of states with the largest expenditure, which is announced as \$64,700,000. New York will be second with a \$60,000,000 highway program, and Illinois will be third with \$50,000,000. While data has not been received from Pennsylvania, that state will also be well toward the top of the list with large road expenditures.

"From the standpoint of mileage, Louisiana plans to improve the high total of 3200 miles during the current year. Texas has a program calling for the improvement of 2400 miles, and Oklahoma is third with 2300 miles.

ENCOURAGING ASPECT

"Aside from relieving unemployment and furnishing an outlet for materials, the 1931 highway programs in all states have a most encouraging aspect from the viewpoint of the years immediately ahead. In preparation to meet those future needs, the states are expending approximately \$13,000,000 for new equipment and road-building machinery.

"The increase in federal-aid appropriations from \$75,000,000 to \$125,000,000 annually and the emergency appropriation of \$80,000,000 made available for 1931 have been vital factors in stimulating the states to take advantage of the business lull to meet the demand for more highways."

Pedestrians learning—That is if figures don't lie. At any rate casualty reports for 1930 show that since 1927 the total of pedestrian deaths has increased only 5 per cent, while deaths to persons in cars have jumped to 35 per cent.

\$30,000,000 Annual Expenditure Proves 24-hr. Day Problem

TREMENDOUS SCOPE OF DEPARTMENT'S WORK COVERING ENTIRE STATE IS EXPLAINED


By JAMES I. HERZ, Deputy Director

SPEAKING jocularly, the first hundred years may be the test of a man's staying qualities; but to a new official of the State Department of Public Works, the test is accomplished in six months. At the end of the shorter period the official has become so interested in his work and accumulated so many responsibilities he is not concerned about a little matter of 99 years.

The Department of Public Works has a 24-hour day of responsibility. It has a 365-day year of planning and building. Highways, bridges, public buildings, water projects, dams, irrigation projects and related improvements—all indispensable in the mechanism of our fast moving age.

There is nothing academic in the curriculum of the department. Its duties call for material results. As the servant of the expectant taxpayer, it must return work of a character that he can literally see and feel and appraise. But by the same token, the hard work involved is made easier by the tangible and enduring results.

GOING CONCERN

 The Department of Public Works is a going concern. More than \$9,000,000 worth of work on incomplete contracts was taken over when the new department heads took office in January. The legal and moral responsibility for the expending of nearly \$30,000,000 annually falls on the Director and his staff.

In the biennium budget will be found the major plans and specifications—and the bank account. To master the budget's general principles and get a working idea of the details is a test of concentration and study.

The Legislature met in January and the members looked to this department for suggestions and cooperation on all improvement work, dealing, as that work must, in appropriations. In return for the effort made, the Legislature returned to the department a fine measure of confidence and approval.

There was real urgency in the preparations



JAMES I. HERZ

for putting into effect Governor Rolph's program for speeding up improvements for the relief of unemployment. By emergency legislation near \$10,000,000 was made available for the department, much of it to go into public buildings.

That the Governor's wishes were fully met was in evidence when within a few weeks nearly 100 projects were under way. And it should be said in passing that whenever possible the benefits of employment were distributed in the local centers of the work.

The department was successful in advancing the highway construction program. As the press has pointed out, millions of dollars have been put in circulation and thousands of families made to benefit by employment of the bread winners. Nor has the business principle of getting full value for the dollar been neglected.

The end of the first six months found nearly 100 projects of an architectural character under way, and the general highway program had been advanced by at least 90 days. The State's activity as a builder and employer has had a decidedly beneficial effect in light-

Department Gives Work to Many, but Insists on Returns

ening the period of depression, by furnishing more than 8000 persons with employment and a ready market for machinery, materials and equipment running into millions of dollars.

The Highway Commission is the legislative authority in highways affairs; that is to say, it selects roads for improvement and provides the money allocations. But once this highly important service is furnished, the responsibility passes to the Department of Public Works. The Director receives the bids, opens them and makes the awards. Specifications, contracts and supervision are under his authority. And in the case of public buildings, the responsibility from their initiation to completion rests on him and his staff.

A State agency spending so much money and employing directly or indirectly so many people can not escape a relationship to the unemployment problem, especially when the work of that department reaches into every section of the State. The department has felt the strain. In addition to those seeking employment by reason of a change of administration, thousands out of employment have turned to the State for jobs. We have done the best we could up to the full measure of our budgetary allowances. We have tried to keep the human factor in mind and at the same time secure for the State its just dues in service and improvements.

I am hopeful, too, that we have achieved a measure of success that can not be fixed by highways and building construction. In the thousands of contacts we have made with men having public and private business with the department, we have tried to be fair, candid and to the point.

It is not always easy to say No nor always possible to say Yes; but it is, in my judgment, best to use the word that provides a final answer. Frank contact with people leaves no tacks of unfulfilled promises on the record to puncture public confidence.

Looking back over my first six months in this position, I will say that it has been fine to work with Colonel Garrison and the staff; and it is especially gratifying to acknowledge the friendly cooperation of the public in solving our many-sided problems. To write a log of the six months voyage would have left no time to navigate the craft. Hence the record must be sought in the results obtained.

Toll of Auto Deaths Caused by Excessive Speed, Says Report

EXCESSIVE SPEED—that's the outstanding cause of the "appalling loss of life and personal injuries" resulting from motor vehicle accidents.

So says E. Raymond Cato, Chief of the California Highway Patrol, in his monthly report.

As a result of a special analysis of auto accidents made for the first four months of the year and compared with the same period of last year, it is noted that there has been an increase in auto accidents of 13.37 per cent with a resultant 10.71 per cent jump in deaths.

"The California Highway Patrol is particularly interested in deaths occurring outside incorporated cities," says Cato. "Therefore it is of interest to note that such deaths increased only 2.24 per cent, while those inside incorporated cities jumped 17.88 per cent during the four-month period."

As a means of cutting down this toll of life and limb, the report recounts redoubled efforts to wipe out defective brakes. During the month of May 9514 machines were tested and 9.85 per cent were found defective. In all there are 1345 stations authorized to test brakes.

A decrease in the number of applications for drivers' licenses is reported. Applications numbered 34,499, a decrease of 6690 from the April figure.

The actual number of licenses issued was less by 5908 than the total issued the previous month, the May figure being 30,605. Of these, 60 per cent were operators, 21 per cent duplicate operators and 19 per cent chauffeurs' licenses.

State examiners conducted 55 per cent of the examinations and 45 per cent were given by the auto clubs, police and other authorized agencies.

PERSONNEL CHANGES

The following personnel changes were announced this month by Highway Patrol headquarters:

Patrolman Jean S. Thayer appointed acting captain in Colusa County to replace District Inspector R. L. Sheldon, assigned to special duty.

Inspector Harvey Blackwell named acting district inspector in District No. 7, George F. Moynahan, temporarily assigned as assistant supervisor in the Bureau of Traffic Enforcement.

Inspector Paul J. Maxim assigned to Bureau of Weights and Commercial Vehicles.



ALL SMOKED UP—But it soon will be a road. This is a scene on the Arrowhead Trail on the State Highway to Boulder Dam. It shows blasting operations, the cameraman catching an explosion in full force.

He Urges Expansion Of Highway Programs

Growth of motor vehicles, both in number and speed, has far outstripped the highway facilities of the United States, and that is one of the principal reasons for the congestion, danger and discomfort of much of the motor travel of today, said W. R. Smith, president of the American Road Builders' Association.

"There is urgent need at the present time for a marked expansion of highway programs," stated Mr. Smith. "This is especially true of road bond issues which bring immediately the benefits of good roads without unduly increasing taxes. Road bond issues are usually paid for by motor vehicle taxes, which do not increase the burden on real estate. The roads are paid for by the people who receive the most benefit—the road users.

"The United States can not afford to be without safe roads. The death toll of 32,500 annually with 950,000 injured, combined with a property damage due to motor accidents estimated at a billion dollars, makes safe highways a profitable investment," declared Captain H. C. Whitehurst, engineer of highways of the District of Columbia, in discussing the same subject.

Will Earl Lee Kelly Use Gavel as Weapon?

Apparently there's a chance for a good sports writer to turn publicity man.

Riverside Junior High School has presented Earl Lee Kelly, chairman of the California Highway Commission, with a beautifully carved orange wood gavel with which to direct future meetings of the commission.

The presentation was made to the chairman by Commissioner Frank A. Tetley, who explained that the school children of Riverside under the direction of Ira Landis had made the gavel for use of the chairman in keeping order.

Mr. Kelly thanked the commissioner for Riverside's kindness and a resolution was adopted ordering a letter of thanks sent to Mr. Landis.

But—the publicity man is needed to spread tidings concerning Mr. Kelly's height, weight and reach. At that the gavel might help.

It doesn't take much of a car, at that, to last some drivers a lifetime.

Too many men are out in the back yard looking for four-leaf clovers when opportunity knocks at the front door.—*Forum*.

Spectacular Job at Bottom of Sea; 10 Boats, 33 Men Remove Phone Cables

SPECTACULAR as the building of the \$75,000,000 San Francisco-Oakland bridge, one of the world's largest, undoubtedly will be, it is being preceded by one of the most difficult jobs in western telephone history. And this job, too, has spectacular features, mostly under water!

Squarely on the sites of two of the bridge's piers, large as city blocks, are 12 huge telephone cables. They and their lesser predecessors have held this approximate route for nearly a half century, ever since the first cable of 14 wires was laid across San Francisco Bay in 1884. The 12 cables now hold well over 5000 wires, with a peak capacity of 270,000 words a minute. A 36-page newspaper of solid reading matter every minute!

TEN BOATS USED

It is the hope of Charles H. Purcell, State Highway Engineer, that the bridge can be completed in 1937. But before it can be started the pier foundations must be laid. But the foundations can not be laid until the cables are out of the way.

Desiring to cooperate, and to speed the bridge as a great community enterprise, the Pacific Telephone and Telegraph Co. assembled a fleet of 10 boats and 33 men, including a deep sea diver, a life saver, and a squad of seven code signalers. Then on June 30 began a 90-day emergency night-and-day task to move the 12 cables 1000 feet north of the bridge site.

The cables, over two miles long, are buried, for about 1000 feet of their length, under 15 feet of mud and debris accumulated through the years. Each cable must be lifted from the mud and raised 100 feet to the surface of the bay before being moved. The cables have never been disturbed in this way. To pick up one of these 100-ton cables and raise it at one point as high as a 10-story building, and then carry it 1000 feet north, puts an unanticipated strain upon it.

ONE CABLE BREAKS

The danger of splitting a cable and interrupting telephone service was early seen as grave. Extreme care was taken in planning

and executing the job. But, despite all precautions, as the second cable was raised, on the fourth day of operations, it broke in two. Fortunately, the break occurred after the day's traffic peak, and few telephones were affected. Should a larger cable break, one of the two, for instance of the world's largest size, more service would be disturbed, but only for a short time, since spare special "stand-by" lines can be connected in from 15 to 70 minutes. Immediately after the break, the telephone company appealed to patrons to bear with it in a difficult situation.

The deep sea diver engaged in the work is William Reed, a World War naval wreck diver, and one of the heroes of the raising of the American submarine S-51, which sank off Providence, R. I.

SPECTACULAR JOB

The diver's work is somewhat spectacular. One hundred feet under water, he directs the washing of the 15 feet of mud from the cables with a powerful stream of water. Reed's helmet is equipped with ear phones and a transmitter with which he talks to telephone men on the company's barge, "Pacifie," just above him. He directs the operations of derricks and winches in untangling the cables. The stream of water, under 100 pounds pressure, is played upon the cables through a hose equipped with nozzle attached to a "wagon" with runners sliding over the cable. This "wagon" was specially designed by local telephone people for this particular job.

Before the three months' job of moving the cables began, a two months' game of "hide-and-seek" was necessary to locate them under the 15 feet of mud. No one knew precisely where they were. All anyone knew was that they were "out there in the bay." Only when a ship's anchor drags across a cable and breaks it is it necessary to find a cable.

Now, however, all 12 cables must be found. A giant electric "detector" was built by the local telephone people to locate the cables and chart them on a map. This charting was done to prevent delay when the 90-day job began.



"EXCUSE IT, PLEASE!"—Shades of Jules Verne. It's a great work this—moving telephone cables from the bottom of the San Francisco Bay. No. 1 shows how they "shoot" positions; in No. 2 is a U. S. Navy hero, Diver William Reed, who took a prominent part in the rescue work of the S-51. He's getting final instructions from Superintendent F. O. Edmunds. They talk while the diver is under water through the phone around Edmunds' neck—and they're never cut off. No. 3 is the "Pacific," barge flagship of the telephone fleet; No. 4 an insignificant looking gun, but it washes the mud off the twelve cables buried fifteen feet under the waters of the bay; No. 5 gives an idea how they talk to shore.

“California Must Get Together;” Then U. S. Water Aid Seems Assured

“IF THE people of California will iron out their little differences regarding the water problem of the State, then the fight for conservation and proper disposition of this precious fluid will be over.

“I am confident that the Congressional committee which has just toured the State is ready to recommend to Congress that Federal assistance in the form of a loan to the people of this State be granted.

“But that recommendation will not be forthcoming until California appears at the National Capital with a united front, each section of the State agreed upon a program.”

That's how Colonel Walter E. Garrison, Director of the Department of Public Works, sums up the result of the tour throughout the State just concluded by the subcommittee of the House Appropriations Committee. The Colonel and Edward Hyatt, engineer in charge of the Division of Water Resources, accompanied the visitors on their trip.

TO SELL POWER

“It is my opinion,” continued Garrison, “that it will be necessary for the voters of the State to pass a constitutional amendment which will permit the State to develop and sell power.

“In this connection I might add that it appears to be the attitude of the Congressional party that Congress will not come to the aid of this State if there be any danger of the power thus developed falling into the hands of the power trust.

“It seems we must guarantee that such sale shall not be possible.

UNITY ESSENTIAL

“In the meantime, Frank Murphy, chairman of the committee, told me that Congress will not be concerned with the location of any particular dam, the site of a power plant or the particular diversion of any stream in California,” said Colonel Garrison. “All Washington will want to know is:

“Has California a definite program for relief of its most serious problem—**WATER SHORTAGE?** Does California come before us united on a policy to be adopted which

will wipe out, for all time, the menace of water famine?

“That's what we have to do,” continued Garrison. “I think I can safely say that every member of the party which has just visited us is ready to recommend relief for this State.

GET TOGETHER

“Not only is Murphy, as the Republican chairman of the subcommittee, sympathetic, but Congressman Edward T. Taylor, Democrat of Colorado, who may become chairman should the Representatives be organized with a Democratic majority, told me that California stands an excellent chance of getting what it wants in water relief legislation. But he reiterated what Murphy said:

“‘Get together, California! Present a united front to Washington. Settle your differences and the battle is won.’”

The Congressional party arrived in California July 4th after inspecting the Boulder Dam project. A subcommittee of the House Appropriations Committee, they viewed the entire California water problem and concluded their State visit at Klamath Falls on July 14.

GOVERNOR'S PLEA

Headed by Frank Murphy, chairman, of Ohio, they were welcomed officially to the State on Sunday, July 12th, by Governor Rolph at the capital. In addressing the committee and their wives, the Governor told the visitors that California is in dire distress due to the acute water situation. He pointed out that the State's great need was to build impounding dams to store the winter flood waters.

“California is a mighty State,” the Governor continued. “If we can obtain the water which is our dire need we can continue to grow. We will come to you to borrow the money so to conserve this water like business men would. We need the money at the lowest possible rate of interest and as quickly as possible. We will repay it.”

In replying, Murphy said:

“I feel confident that the National government will be sympathetic toward California



"WATER OUR GRAVE PROBLEM!" That's Governor Ralph's message to Congressional committee studying California's gravest issue. The Governor is shown here, surrounded by the visitors as he officially says "Howdy" to Chairman Frank Murphy of Ohio.

in the solution of the serious problem now confronting the State.

"The United States will come to the rescue of California in preventing what might become an enormous calamity, I believe. But first the entire State must agree upon a unified and businesslike plan and guarantee the government that any money advanced will be repaid."

Edward T. Taylor of Colorado, ranking Democrat on the committee, supported Murphy's viewpoint.

Congressman Addison T. Smith, Idaho, Republican, chairman of the House Irrigation Committee, stressed the importance of statewide unity on the problem. He pointed out that California must concentrate on a unanimous proposal to Congress.

SHOW SYMPATHY

"Two of California's delegation in Washington, Senator Johnson and Congressman Swing, were able to obtain a \$165,000,000 Federal appropriation for the Boulder Dam

project, so I am inclined to believe that Congress will consider your appeal in a very sympathetic manner," he said.

The delegation included Congressmen Murphy, Burton L. French, Idaho; Edward T. Taylor, Colorado; William W. Hastings, Oklahoma; Don B. Colton, Utah; Addison T. Smith, Idaho; Robert Luce, Massachusetts, and Congressmen Harry L. Englebright, Clarence F. Lea and Phil D. Swing, California.

The Interior Department was represented by Elwood Mead, Commissioner of Reclamation; while F. J. Bailey, Assistant Budget Director, and William A. Duvall represented the Treasury Department.

Members of the California legislative committee in the party were Senators Crittenden, chairman; Frank Mixter, Tulare; W. P. Rich, Marysville, and Ralph Clock, Long Beach; and Assemblymen Robert Patterson, Taft; Edward Craig, Brea; Harold Cloudman, Berkeley; Frank S. Israel, Stockton; John E. Frazier, Gridley, and Robert P. Easley, Antioch.

Ho Hum! Just a Day in Life of Patrolman

A shiny white motorcycle snorted and coughed its way out of a division headquarters of the California Highway Patrol with Officer A—astride, promptly at 7 o'clock on a bright July morning.

Within an hour he had tagged a truck driver for overloading, given road directions to two tourists and reprimanded a traveling salesman for careless driving.

Two miles farther down the road a woman ran out screaming that her child had a safety pin in her throat. Officer A—took the child in his lap, drove seven miles to a doctor, had the pin removed and returned the child as good as new. Somewhat later, he found a weeping boy beside a dog whose leg had been broken by a passing car. He bound up the leg with pieces of wood and tire tape and sent the boy home happy.

Shortly after lunch Officer A—caught two motorists racing on the highway and tagged both. At 3 p.m. he passed a farmhouse and noted a barn on fire. Hurrying in, he led a cow and a goat to safety and sounded an alarm.



At 6 p.m. Officer A—reported back to headquarters.

"A quiet day," he told his Captain—.

Those are some of the things that happen to a California highway patrolman in his regular daily grind of duties. The events cited didn't all happen on the same day, of course. But they did happen over a period of a few weeks to members of the same county squad, as records of the patrol will show.

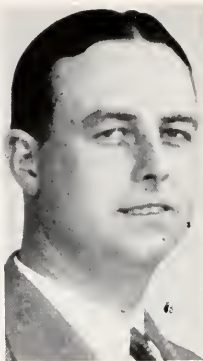
The conception the average person has of the highway patrolman is of one who rides furiously up and down the highways handing out tickets to speeders.

This is far from correct, as only a small part of his duties is handling speeders. The traffic officer is called upon to do a little of everything and the good officer is one who knows how to adjust himself to unusual situations.

Almost every officer can tell of numerous strange things he has had to do in the course of his work.

For example, Captain T. B. Myers of Lake County lists as one of his accomplishments the saving of a woman's life who was being beaten to death with the heel of a shoe by an irate husband. On another occasion Myers met an airplane bringing a doctor and a pulmotor and rushed both to Rainbow Camp on Clear Lake to save a drowned boy's life.

Sometimes it becomes necessary for the officer to abandon his motorcycle and take to the water. Captain G. W. Brown of Sutter County tells of such a case in the flood of 1929 in Marysville when he and one of his men worked for two days in a rowboat



By RUSSELL BEVANS,
Chief Inspector

Strange, Weird Gallant Deeds Some of These!

rescuing marooned families, dogs, chickens, etc., from the tops of buildings surrounded by water. One aged man was carried to safety after he had been on the top of a small building for a day and night.

Captain Fred A. Goodloe has had many a race with speeders, but the race he will remember longest was won from the stork over 17 miles of Shasta County's roughest and crookedest road. He had found a car on its side and an excited young husband standing beside a pale 18-year girl on a pile of bedding. Let Captain Goodloe tell the rest of the story:

"I'll never forget that ride to the hospital. It was 17 miles of pain and fear for the girl, 17 miles of anxiety for the man and 17 miles of curves, hills and loose gravel for me at a speed sometimes 85 miles an hour. But the old white goose outran the stork and a fine 8½-pound boy was born 10 minutes after we arrived at the hospital."

When the St. Francis Dam broke in Ventura County and sent a great flood of water down the valley, Thornton Edwards, a member of the patrol, risked his own life to ride from home to home, warning the people to escape to high ground. Edwards later received a medal for his brave deed. He is now Chief of Police of Santa Paula.

Don't think that every time an officer blows his siren for you to go to the side of the road he is going to arrest you. He may have a message for you instead.

Some years ago, Inspector W. E. Snell and Officer J. E. Reynolds caught an escaped convict at Tehachapi. While Snell was talking over the phone to the Sheriff the escapee grabbed Reynolds' gun from its holster. Reynolds dropped to the floor and yelled "Bill!" Snell turned, drew his gun and fired just as the convict fired. But Snell was the better shot and the convict is dead.

Captain G. F. Daley of Siskiyou County once noted a car parked on the roadside. Investigating, he found a mother with three young children and a man sick with tuberculosis. They were penniless and trying to get to Arizona. Daley drove six miles, brought back bread, butter, milk, bacon and beans and fed the family. He gave them a few dollars and sent them on their way happy.



Captain H. C. Meehan was recently called by a man who informed him a friend was ill in a Sawtell hospital and that he was trying to rush two men to give the patient a blood transfusion. Meehan detailed a car for the trip. The patient recovered.

Workings of Highway Commission

As Revealed by One of Its Members

Just how does the California Highway Commission operate? How does it go about handling the 7500 miles of roadway now in the State system? How are the highway problems of each section of California studied and disposed of? These are some of the pertinent questions which Harry A. Hopkins, commission member from Taft, answers and explains in the following authoritative article on the procedure and policies controlling the activities of the commission.

By HARRY A. HOPKINS, Highway Commissioner

TO attempt to write an article on the above subject after being a member of the California Highway Commission for only six months might be termed impertinence. However we live to learn and in absorbing as much as one human mind could in so short a period we find we could live several lives and not know all that is to be learned in this department of the State Administration. It is a progressive work and every day new developments enlarge our understanding.

The procedure controlling the activities of the California Highway Commission or, as the Legislature terms it, the Division of Highways in the Department of Public Works, is governed to a large extent by the legislative acts of the California State Legislature.

SCIENTIFIC BASIS

The most recent act of the Legislature is the Breed Bill of 1927. This provides a scientific basis of operation and its provisions provide for the division of revenues, classification of highways, division of the State into Northern and Southern groups of counties as well as other important provisions too numerous to mention. Its sections recite, in part, what proportion of the revenues must be used on Primary and Secondary Highways and joint highway districts as well as segregating the funds for construction, reconstruction, maintenance and repairs, administration of the department of the California Highway System.

In fact the Breed Bill provides for most of the procedure that governs the activities of the Division of Highways. However, the Commission has initiated other important procedure and policies.

If the public could be informed more regarding these provisions, under which the Commission works and the laws that make



HARRY A. HOPKINS

that body possible, it would, in a large measure, clear up much misunderstanding in reference to the details of the work. While Governor Rolph has appointed to the California Highway Commission one member from the northern part of the State, one from the north central part, one from the central part and one each from the southeast and southwest parts none represents any particular section of the State. All are appointed at large.

Public Meetings Supply Much Data

Continued from Preceding Page

Yet each naturally is more familiar with that portion of the State surrounding his residence.

Sectional favoritism is not possible both because of Governor Rolph's broad view on State Government Administration and the provisions of the Breed Bill. Yet the Chairman of the Commission has always shown the courtesy of securing the ideas and recommendations of Commissioners being nearest sections where some problem has arisen and upon which suggestions are invited.

COMPLETE UNITY

However after a matter has been fully presented and a clear understanding is had by the Commission, it immediately assumes the status of a State wide matter and Commissioners other than the one residing nearest to its origin might make and second motions for its disposal. The interests of one Commissioner are the interests of all the others.

The execution of the requirements and provisions of the laws appertaining to highways is many times misunderstood or not known to have had their origin in the Legislature. **Citizens many times are under the impression that the California Highway Commission originates the methods or the system under which the Division of Highways is working and feel that many statements and decisions affecting problems and projects are the result of a Commission policy.**

JUSTICE FOR ALL

Handling the affairs of a Commission that has the building and maintaining of ten per cent of the 75,000 miles of roads in California, or 7500 miles now in the California Highway system, naturally would call for rules of procedure in the conduct of the meetings and attending to its routine matters. Many contingencies arise that are unlooked for and many problems are presented that also necessitate some definite policy to govern those that are similar in character. The Commission must work as a unit.

Realizing that in order to do justice to all parts of the State and secure the best results there is an agreement among the members of the Commission and the Director of Public Works that the majority rule will prevail in all matters that come up for a vote. This was the first policy promulgated upon the organi-

zation of the present California Highway Commission.

In carrying out the duties of the Commissioners they are counseled by the attorney for the Commission in legal matters and by the State Highway Engineer in matters of engineering. The Director of Public Works is the directing executive. In a body comprising five men there is represented as many different lines of endeavor. Each has the experience of his own lines of business to assist in deciding the problems that come before the Commission. While none are engineers or practicing attorneys yet each has a background of experience on highway committees of Civic and State organizations as well as experience in City and State highway construction through connections in Municipal and State Governmental official life.

MEETINGS PUBLIC

The meetings of the California Highway Commission are public. Outside of the routine work that the operations of the Division bring before the meeting, covering resolutions allocating funds for contingencies and projects, votes on routes and signing of layout for the same, transferring of funds from time to time, much time is required for public hearings at regular meetings. These hearings are public and are given the citizens of the various parts of the State upon their application to the chairman of the Commission, usually through its members, and the chairman offers every opportunity for all concerned in controversial matters and otherwise to express their views and present their evidence to the Commission.

IMPORTANT POLICY

These hearings have brought to the attention of the public, policies that necessarily had to be put into effect where similar conditions prevailed. One very important policy is that in relation to routes that the smaller cities insist should go through their municipalities. **The Highway Commission desires to cooperate with all cities in the State in this respect, providing the route desired can be built to satisfactorily handle state traffic and in accordance with good engineering requirements and principles. With this understanding the Commission will adopt**

Highway Commission Working as Unit to Build up All State

such route to connect with the State highway, provided the elective body of the city adopts such route by resolution and obligates itself to provide the necessary rights of way to make the street eighty feet wide, and advising the method to be used to finance the same.

When evidence has been shown the Commission that these requirements have been met, then the Commission will build a hard surfaced strip through that street on the adopted route as wide as that outside the city that it approaches.

NUMEROUS DUTIES

Other policies or duties of the Commission, self imposed, are holding hearings in the several communities, attending Civic and State organizations, viewing projects under construction as well as different parts of the highway system, and disseminate such information as will give better understanding on the part of our citizens of the methods, requirements and laws provided in carrying out the business of this Division of the Department of Public Works.

One item that is not understood by the general public is that the Commission does not let contracts for projects. Bids are called for by the State Engineer and the Director of Public Works lets the contracts. The Commission allocates the money for these projects for which bids are called.

WORK AS UNIT

Many invitations are extended the Commission to meet with organizations and cities in almost every part of the State. An early accepted policy, presented by the chairman of the Commission, was to accept as many invitations both in a body and as individual members as consistent and possible.

In conclusion there is one thought that I would like to express. It is that the members of the California Highway Commission are working in unison and cooperating to the extent that the wishes of Governor Rolph will be carried out to the fullest in that this Commission is a Commission representing the citizens of this State and that through their procedure, duties and policies they are working for the best interest of every part and for the upbuilding of our great commonwealth, the State of California.

ISTWAY OADRAY OGSWAY! COPS ACQUIRE "CULTURE"

They are telling this one on big, genial Bert Reeves, sergeant of the Marin County State Police patrol.

"Say, Hewie," booms the ticklish one, "I understand the next class at State Highway police school in Sacramento this summer is to include a class in Pig Latin like the school kids talk."

"You don't say so," replied R. A. Hewitt, the demon bike rider. "What's the idea of learning that stuff?"

"Why simply so that we can talk to the road hogs," chortled the "Big One," as he deftly and gracefully executed a back flip.—*Sausalito News*.

Inter-American Road Progress Outlined

Progress of the Inter-American Highway was outlined to a group of Latin American diplomats and officials of the United States Government by Señor Tomás Guardia at a luncheon in Washington recently.

Sr. Guardia is President of the Inter-American Highway Commission and Chief Engineer of the Central Highway Board of Panamá. The luncheon was given in his honor by the Executive Committee of the Pan American Confederation for Highway Education. Dr. L. S. Rowe, chairman of the Committee, and Director General of the Pan American Union, presided.

The total length of the highway from Laredo, Texas, to Panamá City is 5200 kilometers, Sr. Guardia said, and of this distance two-thirds of the mileage is built, under construction, or easily passable in dry weather. The distance remaining to be built is 1850 kilometers, according to his report, and virtually all of this route has been surveyed.

In the achievement of the ultimate goal of a highway connecting the United States with the Central American countries and Panamá, Sr. Guardia sees no insuperable obstacles. The problems of financing and construction he considers as subordinate to the project of rousing the enthusiasm of the people and nations through which the highway is to pass.

"We must bring the minds of the people to a state where they will appreciate that roads, though entailing exertion, expense and perseverance, are well within the reach of all and that the benefits derived soon surpass the sacrifices involved," he said.

Did you know that: Ninety-four per cent of all automobiles stolen during 1930 were recovered?

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
ERIC CULLENWARD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 JULY, 1931 No. 7

"Wise Recommendation" Says Los Angeles Times

It has been recommended by the directors of the Automobile Club of Southern California to the Supervisors of Los Angeles county that the present county motor patrol of highways be given in charge of the State's traffic department, thus saving \$161,000 a year which, it is suggested, might be spent in grade separations and other highway improvements.

This seems to be sound sense. The present patrol service is good but too expensive in that it involves a duplication of work and of pay rolls. It has been pointed out to the Supervisors that the county has to pay 40 per cent of the cost of the State patrol anyway, this being its share of the taxes used for this purpose.

No complaint whatever is made by the Auto Club of the work of the men of the county patrol, in fact, they have nothing but praise for it. But the duplication of service is felt to be unnecessary. Perhaps, also, if the State patrolmen had no assistance from the county they would feel that they had greater responsibility and could perform their work with freer hands. In any event, it does not appear that they would have so much more to do that they could not render efficient service.—(L. A. Times editorial)

ROMANCE OF INSURANCE

How a business that started with less than \$100 grew into a six hundred million dollar annual expenditure is recalled by the anniversary of the first fire insurance policy ever written on an automobile, says a leading insurance publication. This policy was written June 2, 1902, by the Boston Insurance Company on a two-seated single cylinder French make car. The insured was protected only against fire in the sum of \$1,000.

The premiums paid in California last year were more than \$50,000,000.

Unemployed Given Work on Highways As Relief Measure

(From San Luis Obispo Telegram)

WITH the establishment of unemployment camps on the upper end of the San Simeon-Carmel highway where hundreds of men were employed and with the enlargement of the maintenance crews, Lester H. Gibson of San Luis Obispo, district engineer of the State Highway Department, estimates that 600 men were employed in the district.

* * *

The policy of giving positions to unemployed men on the road work of the district was a part of the plan of the department of Public Works to aid in relieving the unemployment of the nation.

* * *

The funds provided for the purpose are now spent, and the relief work is over. Mr. Gibson says that at the close of the period over which employment was furnished it was evident that unemployment situation of the winter months was considerably relieved. The men were leaving the highway department to find work in other kinds of business.

* * *

The number of dependents of each of 600 men employed has averaged about four to the man, so that the district has taken care of about 3000 individuals, Mr. Gibson estimates.

By means of questionnaires, the highway department determined the need of the individual before he was employed in order to give work to the most deserving.

* * *

The men were willing workers, eager to demonstrate their appreciation of the jobs offered. The men employed on the maintenance crews were given three days' work per week so that by employing two separate shifts, work could be furnished to a larger number of men, and a greater amount of relief given, Mr. Gibson said.

A MOTORIST'S PRAYER

Teach us to drive through life without skidding into other people's business. Preserve our brake linings that we stop before we go too far. Help us to hear the knocks in our own motors and close our ears to the clashing of other people's gears. Keep alcohol in our radiators and out of our stomachs. Absolve us from the mania of trying to pass the other auto on a narrow road. Open our eyes to the traffic sign and keep our feet on the breaks.—*Outlook*.

Gleaned From Letter Bag

Highway Patrol Wins Commendations; Courtesies and Firmness Both Praised

From Mrs. C. L. Corson, Burlingame: Having just returned from a trip to my mother's, I wish to take this opportunity of thanking Traffic Officer 418 for his wonderful service in helping to check a fire on the "Coward Place" near Arno. Had it not been for his wonderful help the fire no doubt would have taken dwelling and all frame buildings. Kindly accept my thanks for the services rendered.

* * *

SPLENDIDLY EFFICIENT

From Robert and Olive d'Erlach, Berkeley: We hereby desire to express our appreciation of the splendid and efficient aid rendered to us by Officer Eisenhuth of El Dorado when he found us injured on the Mother Lode road.

Our machine having left the road, we were helpless and Mr. Eisenhuth never left us until after he had seen us safely installed at the Placerville Sanitarium. He also communicated with my firm's district representative and took good care of our belongings.

In other words, Mr. Eisenhuth not only did his official duty, but extended courtesy and sympathetic attention to details which meant much to crippled folk in strange surroundings.

The department as a whole and Mr. Eisenhuth in particular has our sincere regard and esteem.

* * *

LODGE IS GRATEFUL

From E. Hansen, San Francisco: On behalf of Oriental Lodge, No. 144, F. & A. M., I want to express to you our thanks for the fine service you rendered in arranging escort of Captain Joe Blake and Officer Tom Taylor on our recent pilgrimage from Sacramento to Colfax. The officers handled our caravan in the most efficient manner.

* * *

HE'D EVEN TOW HIM

From L. P. Aldrick, Oregon: It is with considerable pleasure to me to be able to report to you a little incident that occurred just north of Vallejo.

I was driving to San Francisco and ran out of gas about two and one-half miles north of Vallejo. In free wheeling down a little grade, I noticed one of your highway patrolmen seated in his car watching the traffic. He evidently observed that I was well to the side of the road and going rather slow as compared to the traffic in general, sensing without a doubt that I was in trouble. My car finally stopped 300 or 400 yards beyond where he was stationed, and he immediately came down to see if he could help me and suggested if I had a tow line he would be glad to tow me to the next service station. He was very courteous and apparently willing to do what he could to assist me.

This Writer Even Likes His Arrest; Multi- farious Duties Done by State Squad

During the past year I have made seven or eight trips to California by automobile and have observed that your patrolmen are a credit to your State. It is with pleasure that I report this incident of your Officer No. 39.

* * *

From L. O. Myers, D.D.S., San Francisco: May I take this opportunity of telling you of the courtesy of one of your men. This officer gave me a tag for lack of trailer license, a matter that I was in ignorance of.

There is so much difference in some men that my friends and myself, on this trip, want you to know that an entire force made up of men of his type would be a credit to the State of California. This officer could give anybody a tag and make him like it. As near as I can read the name it is a Mr. Monteverde, No. 143.

* * *

ACCIDENTS CUT DOWN

From W. C. Parcher, Independence: Having been much concerned during the past few years over the number of serious accidents that have occurred on the State highway through Inyo County and having noted with much pleasure the marked decrease in these accidents since the establishment of the patrol system here, I wish to congratulate you upon the personnel of your Inyo County squad.

The men of this squad, under the very efficient direction of Captain Buer, are doing a fine job. This was especially noticeable during the Decoration Day week end when the heaviest traffic ever known in this county was handled without an accident or serious trouble of any kind.

* * *

FUNERALS ESCORTED

From R. L. Tudsbury, Loomis: May I not apprise you of our family's deep appreciation of the services rendered to us during the funeral of my mother last May, as well as the funeral of my father this May by your traffic officers of Placer County?

I wish to take this opportunity of commending most highly the captain of your patrol, Charles LaPorte, for the kind, efficient and understanding handling of our two caravans.

* * *

SHORT, BUT SWEET

From Bulah Baker Hughes, Davis: It affords me great pleasure to commend to you the courtesy and intelligence of Officer Burle Reynolds, who was able to help me when our car stalled above Kyburz last week.

New Labor Laws Will Be Enforced

Continued from page one



ALL IS CONFUSION to the layman, but this equipment is part of that which is being employed to rush the Newcastle tunnel job to completion. When completed, the tunnel will take highway traffic under the city and relieve considerable congestion.

PROPOSED WORK—(CONTINUED)

Road	Limits	Amount
V-SBt—Bridge	-----	\$10,000
VIII-SBd—Devore to Alray	-----	437,200
IX-Mno—Casa Diablo Hot Spring to Deadman Creek	-----	183,600
V-SB—Los Alamos to Solomon's Summit	-----	448,500
VII-La—Washington Blvd. to El Segundo	-----	400,000
VIII-SBd—Grade separation	-----	60,000
I-Mer—Little Damm Creek to Leggett	-----	35,000
IV-CC—San Pablo Creek to Crockett	-----	386,000
II-But—Pulga River to county line	-----	483,400
VIII-imp—Coyote Wells to Dixieland	-----	492,400
VIII-imp—Dixieland to 7 miles west	-----	170,000
VII-Ven—Ventura to El Rio	-----	100,000
II-Tri—Approaches to Trinity River bridge	-----	27,500
V-Sho—Los Berros Creek to Arroyo Grande	-----	336,100
I-Hum—Redwood Creek to Willow Creek	-----	58,400
V-Mon—Approaches to Brodley bridge	-----	40,000
V-SB—Los Alamos Creek bridge	-----	31,000
IV-Men—Russian River bridge	-----	30,000
III-Pla—Gold Run to Airport	-----	780,000
VII-Ors—Newport to Corona Del Mar	-----	281,300
VII-La—Las Flores Canyon to Santa Monica	-----	510,200
I-Hum—Bridge	-----	43,500
VIII-Riv—Mecca-Blythe road	-----	300,000
X-SF—Waterloo road to Clements	-----	213,000
III-Pla—Grade separation	-----	20,000
VI-Ker—Kern River bridge	-----	400,000
Total	-----	8,726,500

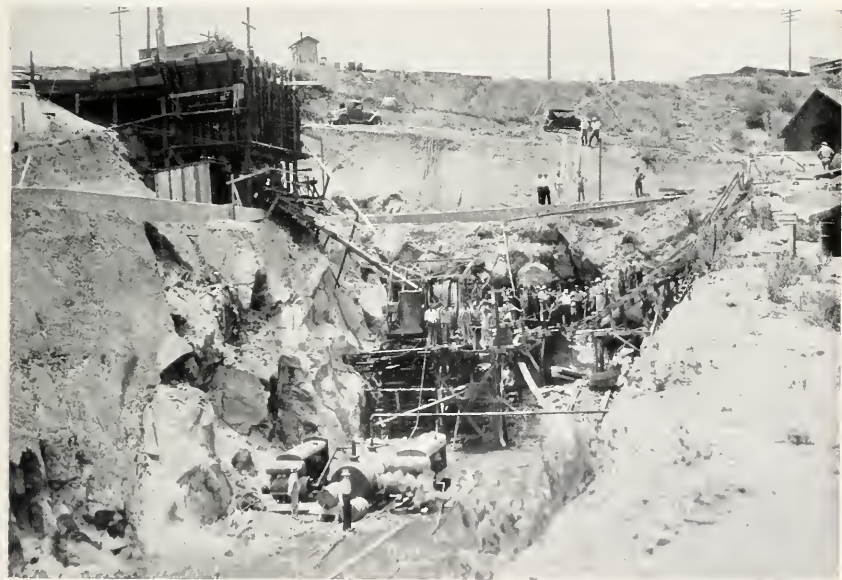
The Department of Architecture announces a formidable list of projects also. Those herein enumerated will be under actual construction in the field during this half year.

Institution	Project	Amount
San Francisco College	additional classrooms	\$100,000
New State Hospital in southern California	second unit for patients	350,000
National Guard	Yuba City Armory	25,000
Industrial Home for Adult Blind	superintendent's residence	15,000
Napa Hospital	improvement to wards	25,000
Mendocino Hospital	laundry	60,000
Sonoma State Home	school and gymnasium	40,000
Sonoma State Home	fire house	31,000
State Narcotic Hospital	two ward buildings	40,000
Preston School	shop building	25,000
Santa Barbara College	training school	70,000
Patton Hospital	dairy unit	25,000
Agnew's Hospital	kitchen equipment	20,000
School for Deaf	improvements	2,240
Napa Hospital	roads	6,300
Preston School	improvements	5,737
Department of Agriculture	border stations	18,000
Narcotic Hospital	service connections	3,708
Stockton Hospital	remodel laundry	5,400
School for Blind	improvements	5,400
San Diego College	sprinklers	2,700

List of New Work Projects Released

Continued from preceding page

Institution	Project	Amount	Institution	Project	Amount
New State Hospital in southern California, roads and walks		10,000	Pacific Colony, Ward Building No. 3		55,000
New State Hospital in southern California, employees' quarters		100,000	Narcotic Hospital, physician's cottage		10,000
New State Hospital in southern California, employees' kitchen and dining room		100,000	Agnews Hospital, physician's cottage		10,000
New State Hospital in southern California, Administration Building		50,000	Whittier State School, employees' cottage		8,500
New State Hospital in southern California, farm group		30,000	Department of Finance, addition to printing plant		81,000
New State Hospital in southern California, laundry		50,000	Pacific Colony, Ward Building No. 15		50,000
Narcotic Hospital, superintendent's residence		16,000	Agnews Hospital, pathological laboratory		80,000
Preston School, farm cottage		4,000	Sonoma State Home, physician's cottage		10,000
Preston School, dairy unit		60,000	School for Blind, addition to girls' house		2,000
Humboldt College, training school		170,000	Norwalk Hospital, ward building at farm		75,000
Chico College, library and classrooms		117,000	California Institution for Women, dairy		5,000
San Quentin Prison, cell block		300,000	Stockton Hospital, kitchen, bakery, cold storage		118,000
San Quentin Prison, solitary confinement		25,000	San Jose College, Science Building		202,000
School for Deaf, primary school and dining room		227,000	Pacific Colony, addition to dining room		35,000
Whittier State School, barn, garages and warehouse		12,000	Pacific Colony, patients' farm cottage		35,000
San Diego College, gymnasium		205,000	San Quentin Prison, prison wall		50,000
San Quentin Prison, Industrial Building		50,000	San Quentin Prison, jute mill		15,000
Fresno College, library		115,000	Folsom Prison, kitchen, commissary and cold storage		100,000
Veterans' Home, hospital		500,000	New State Hospital in southern California, first unit for patients		350,000
National Guard, Pasadena Armory		50,000	Veterans' Home, relocating Company "C" Building		2,550
Sonoma State Home, cottage for boys		75,000	Agnews Hospital, water system		10,000
California Institution for Women, Detention Building		106,000	National Guard, additions at training camp		75,738
Santa Barbara College, Science Building		120,000	Folsom Prison, warehouse		5,000
			Napa Hospital, remodeling		81,000
			Napa Hospital, improvements		25,000
			Total		\$4,858,273



DIGGING IN—The boys on this Newcastle tunnel job are out for lunch. The scene is that of the east portal of the project. The tunnel will run under the main section of the town. Three drifts are being developed which later will be consolidated into the auto subway.

Motorists' Fees Remedy Road Like This



ROUGHING IT—in Bear Valley. Here's your typical "Ozaik, Missouri," road on the route from Emigrant Gap to Nevada City. This section has not yet been reached by construction, but the road—a reminder of the early auto days—is still used.

THE Division of Motor Vehicles has accounted for its stewardship of funds collected from the motorists of the State during the first half of 1931, by apportioning the huge sum of \$6,176,513.91 to the counties of the State and to the Division of Highways for road maintenance purposes.

One half of this amount, or \$3,088,256.96, goes to the Division of Highways and will be expended by the State's road building organization. The other half is apportioned among the fifty-eight counties according to automobile registrations.

The amount apportioned is substantially greater than last year despite an augmented program of highway patrol and protection financed from license fees. The apportionment practically enables the motorist to get his money back in the form of good roads.

This total of registrations does not include cars exempt from payment of fees such as

those owned by public corporations and is a gain of 38,153 vehicles over the same period of 1930.

The apportionment is based on fee-paid registrations for the period totaling 2,006,165 for the six months period.

The registrations for the period are divided as follows: Passenger cars, 1,855,236; solid trucks, 10,514; pneumatic trucks, 85,675; motoreycles, 7,949; solid trailers, 7,737; pneumatic trailers, 39,054.

Los Angeles County with more than one-third of all the registrations will receive the largest share or \$1,265,276.11. San Francisco County will receive \$229,414.30, the second largest share. Alameda County will receive \$218,795.63.

Here's an interesting fact: Sixteen per cent of the motor vehicles made in the United States in 1930 were exported.

Stately Monarchs of Forest Preserved



LONG LIVE THE KING—This superb stand of Redwoods, on the South Fork of the Eel River, with 10,000 acres of surrounding forest, is declared by experts to be a perfect example of redwood growth, which, once destroyed, never could be reproduced. The area has been purchased and will become a part of the State Park system. John D. Rockefeller, Jr., contributed \$1,000,000 toward the purchase.

The renowned Bull Creek and Dyerville forests, acclaimed by world travelers the supreme development of California's giant redwoods, and considered of the same national importance as Yosemite, Grand Canyon and other unique national wonders, are assured of preservation as a part of California's State Park system.

This is the announcement of the California State Park Commission, which has reported through the Director of Natural Resources to Governor James Rolph, Jr., that negotiations with the Pacific Lumber Company, owner of these redwood groves, have reached a successful conclusion, and that 10,000 acres, including the watersheds of Bull Creek, Becker Creek and Cabin Creek, as well as the North and South Dyerville Flats, will be acquired.

The acquisition of these redwoods culminates a campaign of over ten years conducted by the Save-the-Redwoods League, and begun by its founders, Dr. John C. Merriam of the Carnegie Institution of Washington, Madison Grant of New York, and Dr. Henry Fairfield Osborn of the American Museum of Natural History.

Under the terms of the State Park Bond Act, passed by the Legislature in 1927, and ratified by the people of the State, half of the total cost of the project is to be borne by the State and half by the Save-the-Redwoods League. The saving of these redwoods was prominently featured in the campaign for the State Park bonds.

The Save-the-Redwoods League has announced that it has secured sufficient contributions and pledges to match State Park bond funds for the acquisition of these lands. Many public-spirited individuals and organizations throughout the United States have contributed.

John D. Rockefeller, Jr., by a gift of \$1,000,000 and a pledge of a second million to match private gifts as received, made possible the success of the project.

Organizations such as The Garden Club of America, the California Federation of Women's Clubs and the Native Daughters of the Golden West contributed substantial funds.

When Bowling Along Highways, He Gives Cheer for Builders

By J. A. GREGORY, District VIII Right of Way Agent

TODAY we seem to be at the beginning of a new era in highway building and progress. The men who are responsible for construction of the highways of today are entitled to a great deal of commendation. We get in our car and start out for the beach, mountains or desert, and as far as roadbed is concerned we ride with ease.

Little thought is given to the origination of such highways and the vast amount of field work and office work necessary before even construction work begins. As we ride over mountain roads, where the country is thick with brush and forests, little thought is given to the surveyor and locator who battled and cut his way through such places to make the location. All such surveys and locations after being made in the field are then brought in to the offices of the Division of Highways, where prints of routes, together with maps of elevations, cuts and fills, etc., are made which show exactly where that certain route is located. All such plans after completion are then forwarded to the central office, Sacramento, for approval.

After plans have been returned with an O. K. from Sacramento, in due time that certain project is advertised for bids, which are opened in the offices of the Department of Public Works.

These are a few of the high lights preparatory to the construction of the wonderful highways we have throughout the State today.

To some it would seem extravagant completely to change a dedicated roadbed to an elevated position practically paralleling the same route. This is where the maintenance cost of highways figures in. A yearly check on repairs, grading and cleaning off storm refuse from highways and the great inconvenience to motorists, commercial and others, are checked against the cost of new construction, which through the elevated grade and storm drains, practically eliminates flood damage.

Too much can not be said in commendation for the Governor who approves road construction budgets, the Legislators, who also have their part, and the Director of the Department of Public Works, who sees them through to a final conclusion, and last, but not least, the gas tax that makes it all possible.

17 Stolen Machines Recovered by Patrol; 21 Officers Cited

SEVENTEEN stolen autos were recovered and seventeen persons arrested as automobile thieves during the month of June, due to the efforts of the Highway Patrol.

In addition, several lives were saved by efforts of patrolmen.

The facts are brought out in a list of citations given out by Chief E. Raymond Cato, who names twenty-one members of the organization for good work done during the past month.

TEN GET THIEVES

Ten men were commended for their work in nabbing the auto thieves. They are Tony Rose, Joseph Lewis, C. R. Avellar and A. Larsen of Alameda County; Captain S. M. Flynn and C. A. Lunnen of Ventura County, L. N. Harvey of San Diego County, R. H. Trenbath and R. Cockerton of Contra Costa County and J. C. Shanks of Sonoma County.

Two officers, J. N. Nobel and R. J. Parr of Ventura County, received commendation for their rescue of two fishermen caught by the tide.

SAVES A LIFE

Two others, N. Vadnais and C. K. Gill of Alameda County, were cited for rendering assistance to a man and woman hurt in a plane crash.

Inspector M. F. Brown, Eureka, took pneumonia serum to an outlying point and saved a patient's life, thereby earning notice. F. Perry was commended for assistance in checking a fire in Sacramento County.

Captain M. Carter and John Shaffer of Tehama earned citations for first aid given a woman whose husband had been killed in an automobile accident.

HERE'S BRAVE ACT

W. Fonyer of Nevada County earned a citation for the capture of a bandit at night who had drawn a gun. Fonyer threw his spotlight in the man's eyes and captured him without a struggle.

L. Trenner of Monterey County was commended for assisting the police of Pacific Grove in giving first aid to persons involved in an automobile wreck.

L. Sample, a border checker of San Bernardino County, was commended for assistance given the authorities of Nevada in capturing two murder suspects.

Work is Progressing On Alternate Ridge Route Construction

S. V. Cortelyou, District Engineer, reports rapid progress on highway construction work in District 7. Extracts from his report show:

IN LOS ANGELES COUNTY—Work is rapidly nearing completion on the first grading contract of the Alternate Ridge Route. This portion is between Castaic and Canton Creek and is being constructed by Doering von der Hellen & Pierson, contractors.

The second grading contract on this route, from Canton Creek to Piru Gorge, was awarded to the Will F. Peck Company April 23, 1931. Work is now in progress on this section and the grading of the work will be completed by approximately September 1, 1932.

Bids will be opened for the third and final grading contract on this project July 15, 1931, so that grading for the entire length of the Alternate Ridge Route will be under contract shortly after that date.

IN ORANGE COUNTY—Paving work was recently completed on the Galivan line change, a distance of 0.93 mile. This new alignment crosses the Santa Fe Railroad tracks on an overhead crossing which was constructed a few years ago. A con-



THEN AND NOW—Surely a real study in contrasts. The "Before" photo is a good ad for So & So's tractor—at least one would need it to traverse that road. But the same scene depicted below, typical of highway improvement between Mojave and Bishop, is an old story to Californians—a long, level stretch of modern road.

tract has recently been awarded for widening the grading and pavement for a distance of approximately $5\frac{1}{2}$ miles along the Serra Bluffs from San Mateo Flat to Serra.

IN SAN DIEGO COUNTY—A line change at

Bostonia, which greatly improves the alignment on this section, is now under construction. Portland cement concrete pavement 20 feet wide has been completed and this portion of the highway will be opened to traffic in a short time.

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of June, 1931.

VENTURA COUNTY—Los Posas Wash No. 766. J. N. Thille and Peter Connely, Santa Paula, owner; earth, 10 feet above streambed with a storage capacity of 50 acre-feet, situated on Los Posas Wash tributary to Revelon Slough, for silt storage purposes.

RIVERSIDE COUNTY—San Jacinto Dam No. 812. J. C. Agee, Artesia, owner; earth, 22 feet above streambed with a storage capacity of 60 acre-feet, located in Sec. 18, T. 3 S., R. 6 W., S. B. B. and M.

MODOC COUNTY—Dry Valley Dam No. 121-5. Bixby-Huffman Cattle Co., Alturas, owner; earth, 3 feet above streambed with a storage capacity of 100 acre-feet, situated on Dry Valley tributary to Willow Creek in Sec. 12, T. 46 N., R. 10 E., M. D. B. and M., for storage purposes, for irrigation and stock use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of June, 1931.

SAN MATEO COUNTY—Whitehouse Creek Dam No. 607. Humphrey Estate, Inc., Pescadero, owner; arch dam, 21 feet above streambed with a storage capacity of 9 acre-feet, situated on Whitehouse Creek in Sec. 8, T. 9 S., R. 4 W., M. D. B. and M., for storage and diversion purposes, for irrigation use. Estimated cost \$2,750, fees paid \$27.50.

LOS ANGELES COUNTY—Verdugo Wash Dam No. 32-4. Los Angeles County Flood Control District, Los Angeles, owner; earth, 32 feet above streambed with a storage capacity of 108 acre-feet, situated on Verdugo Creek tributary to Los Angeles River, located in Rancho San Rafael. Estimated cost \$33,182, fees paid \$331.82.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of June, 1931.

SOLANO COUNTY—Swanzy Lake Dam No. 443. Calif. and Hawaii Sugar Refining Corp., Crockett, owner; earth dam, located in Vallejo Township.

MODOC COUNTY—Spaulding Dam No. 154. R. D. Craig, Malin, Oregon, owner; earth dam, situated on unnamed drainage tributary to Tule Lake in Sec. 2, T. 42 N., R. 7 E., M. D. B. and M.

VENTURA COUNTY—Hall Canyon, Lower Dam No. 764-2. Associated Oil Company, San Francisco, owner; earth dam, situated on Hall Canyon Creek tributary to Pacific Ocean in Rancho Ex Mission San Buenaventura.

RIVERSIDE COUNTY—San Jacinto Dam No. 812. J. C. Agee, Artesia, owner; earth, located in Sec. 19, T. 3 S., R. 6 W., S. B. B. and M.

RIVERSIDE COUNTY—Lake Norcorian Dam, West, No. 820. Rex B. Clark, Norco, owner; earth, located in Sec. 12, T. 3 S., R. 7 W., S. B. B. and M.

ORANGE COUNTY—South Lambert Dam No. 793. The Irvine Co., Tustin, owner; earth, located in Lot 268 of Irvines subdivision.

MONO COUNTY—Walker Dam No. 533. Archibald Farrington, Mono Lake, owner; earth and rock, situated on Walker Creek tributary to Rush Creek in Sec. 7, T. 1 S., R. 26 E., M. D. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of June, 1931.

LOS ANGELES COUNTY—Pine Canyon Dam No. 19. City of Pasadena, Pasadena, owner; gravity dam, 217 feet above streambed with a storage capacity of 40,900 acre-feet, situated on San Gabriel River tributary to Pacific Ocean in Sec. 13, T. 1 N., R. 10 W., S. B. B. and M., for storage purposes for municipal and domestic use.

NEVADA COUNTY—Lower Lindsay Lake Dam No.

97-36. Pacific Gas and Electric Company, San Francisco, owner; earth and rock, 113 feet above streambed with a storage capacity of 290 acre-feet, situated on Texas Creek tributary to South Yuba River in Sec. 20, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes for power use.

ALAMEDA COUNTY—Upper Alameda Creek Diversion Dam No. 10-9. City and County of San Francisco, San Francisco, owner; slab and buttress dam, 32 feet above streambed with a storage capacity of 15 acre-feet, situated on Upper Alameda Creek tributary to Calaveras Creek in Sec. 17, T. 5 S., R. 2 E., M. D. B. and M., for diversion purposes, for municipal and domestic use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of June, 1931.

LOS ANGELES COUNTY—Big Santa Anita Dam No. 32-2. Los Angeles County Flood Control District, Los Angeles, owner; arch dam, situated on Big Santa Anita Creek tributary to San Gabriel River in Sec. 10, T. 1 N., R. 1 W., S. B. B. and M.

MONO COUNTY—Sardine Lake Dam No. 533-2. Archibald Farrington, Mono Lake, owner; rock, 10 feet above streambed with a storage capacity of 30 acre-feet, situated on Walker Creek tributary to Mono Lake in Sec. 15, T. 1 S., R. 25 E., M. D. B. and M.

VENTURA COUNTY—Lower Hall Canyon Dam No. 764-2. Associated Oil Company, San Francisco, owner; earth dam, situated on Hall Canyon Creek tributary to Pacific Ocean, located in Rancho Ex Mission San Buenaventura.

BUTTE COUNTY—Round Valley Dam No. 97-9. Pacific Gas and Electric Company, San Francisco, owner; earth dam, situated on North Fork Feather River tributary to Feather River in Sec. 50, T. 26 N., R. 5 E., M. D. B. and M.

LOS ANGELES COUNTY—Devils Gate Dam No. 32-3. Los Angeles County Flood Control District, Los Angeles, owner; gravity dam, situated on Arroyo Seco, tributary to Los Angeles River in Rancho San Pascual.

RIVERSIDE COUNTY—San Jacinto Dam No. 812. J. C. Agee, Artesia, owner; earth dam, located in Sec. 19, T. 3 S., R. 6 W., S. B. B. and M.

RIVERSIDE COUNTY—Lake Norcorian, West Dam No. 820-A. Rex B. Clark, Norco, owner; earth dam, located in Sec. 12, T. 3 S., R. 7 W., S. B. B. and M.

WATER APPLICATIONS AND PERMITS

LOS ANGELES COUNTY—Application 6970. Harry M. Miller, Little Rock, Calif., for 2 miners inches or 0.05 c.f.s. from an unnamed spring tributary to Mojave Desert. To be diverted in Sec. 16, T. 4 N., R. 10 W., S. B. B. and M., for irrigation and domestic purposes (2 acres).

ALPINE COUNTY—Application 6971. State of California, Department of Public Works, Division of Highways, District X, by C. H. Purcell, State Highway Engineer, Sacramento, Calif., for 0.016 c.f.s. from an unnamed spring tributary to Middle Fork of Stanislaus River. To be diverted in Sec. 35, T. 6 N., R. 20 E., M. D. B. and M., for domestic purposes. Estimated cost \$1,000.

NEVADA COUNTY—Application 6972. C. A. Casey, Mill Valley, Calif., for one miners inch from a spring tributary to Middle Fork of Yuba River. To be diverted in Sec. 5, T. 17 N., R. 8 E., M. D. B. and M., for mining and domestic purposes.

KERN COUNTY—Application 6973. Clinton E. Albertson, Los 35, Inyokern, Calif., for 500 gallons per day from a well. To be diverted in Sec. 26, T. 27 S., R. 40 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$200.

SIERRA COUNTY—Application 6974. Minnie F. Dutton, 1053 N. Ardmore, Los Angeles, Calif., for 25 c.f.s. from South Fork of North Fork of Yuba River tributary to North Fork of Yuba River. To be diverted

June Water Applications and Permits

in Sec. 30, T. 20 N., R. 12 E., M. D. B. and M., for power purposes.

TUOLUMNE COUNTY—Application 6975. State of California, Department of Public Works, Division of Highways, c/o C. H. Purcell, State Highway Engineer, Public Works Bldg., Sacramento, Calif., for 0.616 c.f.s. from an unnamed spring tributary to South Fork of Tuolumne River. To be diverted in Sec. 35, T. 1 S., R. 19 E., M. D. B. and M., for domestic purposes. Estimated cost \$1,000.

SAN BERNARDINO COUNTY—Application 6976. Wayne Courtney, 1318 W. 94th street, Los Angeles, Calif., for 3 c.f.s. from Antelope Canyon tributary to Mojave Desert. To be diverted in Sec. 29, T. 2 N., R. 4 E., S. B. B. and M., for irrigation and domestic purposes.

KERN COUNTY—Application 6977. W. F. Elwin and Noah Adair, c/o C. L. Adair, 308 Date street, Rialto, Calif., for 3 c.f.s. from wells tributary to Goler Creek, tributary to Mojave Desert. To be diverted in Secs. 34 and 35, T. 28 S., R. 39 E., M. D. B. and M., for mining purposes. Estimated cost \$3,000.

TRINITY COUNTY—Application 6978. Edward L. Schreckengost, Douglas City, Trinity County, Calif., for 2 c.f.s. from Browns Creek tributary to Trinity River. To be diverted in Sec. 19, T. 31 N., R. 19 W., M. D. B. and M., for mining purposes. Estimated cost \$600.

HUMBOLDT COUNTY—Application 6979. Ulysses S. Grant Myers, Weott, Calif., for 0.025 c.f.s. from Pete Creek tributary to South Fork of Eel River. To be diverted in Sec. 30, T. 2 S., R. 3 E., H. B. B. and M., for domestic purposes. Estimated cost \$2,750.

TULARE COUNTY—Application 6980. Frank O. Sheldon, P. O. Box 68, Porterville, Calif., for 200 gallons per day from a spring tributary to South Fork of Middle Fork of Tule River. To be diverted in Sec. 32, T. 20 S., R. 31 E., M. D. B. and M., for domestic purposes. Estimated cost \$35.

TULARE COUNTY—Application 6981. N. N. Redford, A. M. Griggs, R. Y. Roper, c/o N. N. Redford, Exeter, Calif., for 600 gallons per day from Monarch Creek tributary to East Fork of Kaweah River. To be diverted in Sec. 15, T. 17 S., R. 31 E., M. D. B. and M., for domestic purposes.

TRINITY COUNTY—Application 6982. Basil Froloff, Weaverville, Calif., for 12.5 c.f.s. from Rush Creek tributary to Trinity River. To be diverted in Sec. 21, T. 34 N., R. 9 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$50.

PLACER COUNTY—Application 6983. Brockway Land & Water Co., a Corporation, c/o Jessie H. Miller, Atty., 712 DeYoung Bldg., San Francisco, Calif., for 1.0 c.f.s. from Griff Creek tributary to Lake Tahoe. To be diverted in Sec. 18, T. 16 N., R. 18 E., M. D. B. and M., for irrigation and domestic purposes (\$41.88 acres).

MERCED COUNTY—Application 6984. Stevenson Water District, a Corporation, c/o Hatfield, Wood & Kilkenny, Atty., 315 Chancery Bldg., San Francisco, Calif., for 175 c.f.s. from McCoy Spillway, Arena Spillway, Livingston Drain, Bear Creek, Owens Creek, Duck Creek, Deadman Creek, tributary to San Joaquin River. To be diverted in Secs. 20, 21, 22, 27 and 33, T. 7 S., R. 11 E., M. D. B. and M., Sec. 12, T. 8 S., R. 11 E., M. D. B. and M., and Secs. 19 and 30, T. 8 S., R. 12 E., M. D. B. and M., for irrigation purposes (21,695.33 acres). Estimated cost \$50,000.

TRINITY COUNTY—Application 6985. Majestic Mines Co., Weaverville, Calif., for 100 c.f.s. from Rush Creek tributary to Trinity River. To be diverted in Sec. 5, T. 34 N., R. 9 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$50,000.

DEL NORTE COUNTY—Application 6986. D. R. Morrison and W. J. Cooley, c/o Daniel M. Hunsaker, Atty., Rowan Bldg., Los Angeles, Calif., for 50 c.f.s. from Elk Creek tributary to Illinois River. To be diverted in Sec. 12, T. 19 N., R. 4 E., H. B. B. and M., for mining purposes. Estimated cost \$200.

SISKIYOU COUNTY—Application 6987. T. A. Sweeney, Ainsworth Bldg., Portland, Ore., for 2 c.f.s. 30 acre-feet per annum from Hungary Creek and unnamed springs tributary to Klamath River. To be diverted in Sec. 36, T. 48 N., R. 8 W., M. D. B. and M., for mining and domestic purposes.

EL DORADO COUNTY—Application 6988. Harold J. Smith, 602-4 Medico Dental Bldg., Sacramento, Calif., for 200 gallons per day from Rock Creek tributary to South Fork of American River. To be diverted in Sec. 18, T. 11 N., R. 17 E., M. D. B. and M., for domestic purposes. Estimated cost \$100.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of June, 1931.

SIERRA COUNTY—Permit 3721, Application 6923. Geo. F. Taylor, Downville, Calif., June 2, 1931, for 50 c.f.s. from Cherokee Creek in Sec. 6, T. 19 N., R. 9 E., M. D. M., for mining purposes.

SAN BERNARDINO COUNTY—Permit 3722, Application 6717. Geneva C. Baxter, Victorville, Calif., June 2, 1931, for 0.4 c.f.s. from Silver Creek Canyon in Sec. 17, T. 3 N., R. 1 W., S. B. M., for irrigation purposes on 180 acres. Estimated cost \$100.

MARIPOSA COUNTY—Permit 3723, Application 6336—Mrs. Estelle L. Fraser, Coulterville, Calif., June 2, 1931, for 39 c.f.s. from North Fork of Merced River in Sec. 7, T. 3 S., R. 18 E., M. D. M., for power purposes.

LOS ANGELES COUNTY—Permit 3724, Application 6511. Ernest E. Pettinger and Ralph Wagner, Saugus, Calif., June 6, 1931, for 0.05 c.f.s. from Drippy Spring in Sec. 25, T. 5 N., R. 16 W., S. B. M., for irrigation and domestic purposes on 4 acres. Estimated cost \$25.

MONTEREY COUNTY—Permit 3727, Application 6065. Florence Hogue, Los Angeles, Calif., June 9, 1931, for 3 c.f.s. from Bixby Creek in Section 15, T. 18 S., R. 1 E., M. D. M., for power purposes. Estimated cost \$9,000.

MONTEREY COUNTY—Permit 3728, Application 6067. Florence Hogue, Los Angeles, Calif., June 9, 1931, for 1 c.f.s. from (2) Bixby Creek, (3) Cross Canyon, (4) Daisy Gulch, (5) Bear Trap Canyon in Secs. 15 and 16, T. 18 S., R. 1 E., M. D. M., for domestic purposes. Estimated cost \$22,000.

MONTEREY COUNTY—Permit 3729, Application 6122. Florence Hogue, Los Angeles, Calif., June 9, 1931, for 1 c.f.s. from Sierra Creek in Sec. 21, T. 18 S., R. 1 E., M. D. M., for domestic purposes. Estimated cost \$8,000.

LAKE COUNTY—Permit 3730, Application 6927. P. V. Pedroncini, Ukiah, Calif., June 10, 1931, for 0.1 c.f.s. from two unnamed springs in Sec. 11, T. 15 N., R. 1 W., M. D. M., for irrigation and domestic purposes on 7 acres. Estimated cost \$3,000.

HUMBOLDT COUNTY—Permit 3731, Application 6911. Mrs. Sarah J. Carpenter, Salyer, Calif., June 19, 1931, for 1.2 c.f.s. from Ammon Creek, in Sec. 12, T. 5 N., R. 5 E., H. B. M., for irrigation purposes on 60 acres. Estimated cost \$800.

BUTTE COUNTY—Permit 3732, Application 6660. A. H. Dakin, Magalia, Calif., June 19, 1931, for 3 c.f.s. from Empire Creek in Sec. 20, T. 23 N., R. 4 E., M. D. M., for mining purposes. Estimated cost \$15,000.

MONO COUNTY—Permit 3733, Application 5953. Harry A. Culver, June Lake, Calif., June 20, 1931, for 0.025 c.f.s. from an unnamed spring in Sec. 14, T. 2 S., R. 26 E., M. D. B., for domestic purposes. Estimated cost \$100.

PLUMAS COUNTY—Permit 3734, Application 6874. Oscar T. Schumacher, Quincy, Calif., June 20, 1931, 1 c.f.s. from an unnamed stream in Sec. 33, T. 23 N., R. 10 E., M. D. M., for mining and domestic purposes.

EL DORADO COUNTY—Permit 3735, Application 6842. J. W. Moore and W. C. Neumiller, Stockton, Calif., June 23, 1931, for 1800 gallons per day from Forni Creek in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$350.

PLUMAS COUNTY—Permit 3736, Application 6872. Max Paul Boehme, San Francisco, Calif., June 3, 1931, for 0.0 c.f.s. from Mill Creek in Sec. 27, T. 25 N., R. 8 E., M. D. M., for irrigation and domestic purposes on six acres. Estimated cost \$150.

SIERRA COUNTY—Permit 3737, Application 6844. Kate Hardy Mining Co., Downville, Calif., June 25, 1931, for 0.205 c.f.s. from an unnamed ravine in Sec. 20, T. 19 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$300.

Here's Hot Article on a Cold Subject

The following article on refrigeration may not be read with avidity by this journal's subscribers in Alaska, but it is particularly timely in Sacramento, where it is being edited on one of the Sacramento Valley's "unusual" days. It is an intensely interesting paper on how to keep cool and how ice and other freezy things are made.

By C. A. HENDERLONG, Assistant Engineer

ALTHOUGH refrigeration as we now know it is a comparatively modern process, it is a known fact that the ancients knew some of its secrets.

Thousands of years before the dawn of the Christian era, the Egyptians produced artificial refrigeration by means of evaporation for the cooling of wines and water. This was done by placing the liquids to be cooled in porous vessels, the evaporation of moisture on the outside cooling the liquid inside. This principle is still employed, for instance, in the desert water bag constructed of heavy canvas. Refrigeration was also obtained by the ancients by means of packed snow brought down from nearby mountains through means of fast runners.

DATES BACK TO 1873

The successful production of refrigeration by the compression system dates back to the invention of the ammonia compression machine in 1873. Subsequent to that time, other experiments produced different forms of mechanical refrigeration; however, none was entirely successful. Mechanical refrigeration was at first applied to the production of artificial ice. It was soon found, however, that ice was not suitable for the preservation of foods at low temperatures and the system of placing expansion or cooling coils directly in the cold storage boxes was developed.

Mechanical refrigeration has now become an absolute necessity in our State institutions and also in hotels, cold storage plants, etc., where it is necessary to keep supplies of perishable food on hand. When it is considered that temperature above 50° F. results in the rapid spoilage of most foods through bacteria growth, the absolute need of refrigeration is apparent. Poultry, for instance, should be kept at about 29° F. if held for any length of time; meat at 32° F.; likewise milk, eggs, etc., around 34° F., and other products at correspondingly low temperatures. Products in storage for long periods are held at somewhat lower temperatures than above.

USES BY STATE

With the development of mechanical refrigeration, its use has been extended to other fields such as the cooling and air conditioning of factories, theatres, etc., various mechanical and chemical processes and the production of dry ice or frozen carbon dioxide (CO₂), etc., besides many other widely different applications.

It is the purpose of this article to describe in a general way the type of refrigerating equipment in use at various State institutions. For the larger State institutions where a number of cold storage rooms must be cooled, the ammonia compression system with brine circulation to the cold storage room coils, is used. The production of cold by means of mechanical refrigeration is a comparatively simple process.

Briefly stated, this is accomplished by the compression of the ammonia gas to about 165-pound gauge, which raises its temperature, and the passing of this gas through a cooler which consists essentially of a series of tubes surrounded by cooling water of about 65° F. The cooling of the ammonia gas under pressure by means of cold water extracts the heat of compression and liquefies it and it is passed from the cooler or condenser to the ammonia receiver.

QUITE A PROCESS

From this receiver it is allowed to enter the expansion or cooling coils at a pressure of about 15 pounds gauge, these coils being submerged in the brine tank. The drop in pressure from 165 pounds to 15 pounds greatly lowers the temperature of the ammonia, resulting in about 0° F. inside of the ammonia coils. From the expansion or ammonia coils the gas is returned to the suction side of the compressor through piping, where it is again compressed and the same cycle repeated.

Pure anhydrous liquid ammonia is the refrigerant most universally used because it liquefies at a comparatively low temperature and its latent heat value is relatively high. It boils at 28½° F. below zero at atmospheric pressure and at sea level. Contrast this with water which boils at 212° F. under the same conditions. The brine tank consists of a steel tank containing a solution of water and calcium chloride (common salt) of sufficient strength so that it will not freeze. The brine is maintained at a temperature of about 14° F. by means of the ammonia coils submerged. Small centrifugal pumps circulate the cold brine through piping to the various coils in the storage rooms.

SIXTEEN COLD ROOMS

At the Patton State Hospital in the recently completed kitchen and bakery building, there is a total of sixteen cold storage rooms ranging in size from the smallest room, approximately 10 feet by 6 feet by 10 feet high, to the largest, 15 feet by 30 feet by 10 feet high. All of these rooms have the floors, walls and ceilings insulated with sheet cork board 4 inches thick, applied in two layers 2 inches thick, with joints staggered. Sheet cork is the insulation most generally preferred because it is impervious to moisture and has a very low thermal conductivity. The brine or cooling coils are placed overhead in bunkers near the ceiling, each room except the very small ones having two bunkers, so as to provide proper air circulation and also permit of defrosting one unit, the other remaining in operation. There are two ammonia compressors installed, one of ten tons capacity driven by a 20-h.p. electric motor and the other of fifteen tons capacity driven by a 30-h.p. electric motor. The operation of



NOT SO HOT—because it's a chilling room, a new one at Patton State Hospital. It had been hoped to cool a hot article by printing a picture showing long, white icicles hanging from pipes, but the world moves on and it is found that the above is the very latest. In other words, there are no more naked chilling pipes in modern architecture. The arrow shows the cooling chambers, enclosed in casings. More sanitary.

these compressors is entirely automatic; that is, when a certain amount of refrigeration has been supplied they automatically shut down and likewise start again when additional refrigeration is required. The correct temperatures in the cold storage rooms are automatically maintained by means of a thermostat in each storage room connected to a brine valve located in the connection to the coils which controls the supply of cold brine.

Electric refrigeration, as it is called, is used extensively in State institutions, usually in the smaller kitchen buildings, doctors' residences, ward buildings, etc. They vary in size from the small household box to larger installations involving several compressors of the remote installation type. These machines virtually all use sulphur dioxide (SO_2) as the refrigerant, because it may be used at very low pressures, considerably below ammonia, thus eliminating the possibility of leakage and other troubles.

With one or two exceptions, all operate on the compression system, the principle of operation being identical to the large ammonia machines with the exception that small units, such as the regular household box, use air circulated through the condenser by a fan to liquefy the compressed gas. Electric refrigeration has been developed rapidly in the last few years and has been installed in several sizeable installations where formerly ammonia machines would be required.

THREE TONS PER DAY

Water ice, or ice made from frozen water, is manufactured at all of the State hospitals, also at Folsom and San Quentin State prisons, the Veterans' Home, Preston School of Industry and the California School for the Deaf.

Some of the institutions are equipped to manufacture what is known as commercially clear ice. Ordinarily in freezing ice, the entrapped air results in cloudy or opaque ice. Clear ice is made by the use of certain equipment which, briefly, consists of a small rotary air compressor, a vacuum pump and a system of small piping conveying the compressed air to the water which is being frozen in each can. The small air bubbles forming on the surface of the ice attach themselves to the larger bubbles introduced by the blower and piping and are liberated from the top of the freezing cake, thus forming clear or transparent ice.

ARE YOU FIFTY-FIFTH?

There is one automobile for every 55 persons in the world. The United States has more than 11 times the average, it is indicated, as there is one vehicle for each 4.5 inhabitants. Outside of the United States the ratio is one automobile for each 216 persons.

California has nearly 100 times this average with an automobile for every 3.5 persons, or more than one to each family in the State.

How Land Is Secured for New Roads; Diplomatic Envoys in State Employ

By C. C. CARLETON, Chief, Division of Contracts and Rights of Way

THIS is the twentieth year of systematic State highway building in California.

While considerable right of way activity has from the outset been prerequisite to the highway work, yet it has only been for a few years that it has become recognized as of major importance on a parity with the engineering itself.

The cost of right of way now represents about 11 per cent of the total State highway construction disbursements.

In earlier years old county roads with their existing widths were adopted as links in the State highway system and any necessary new rights of way were obtained through the county boards of supervisors or civic organizations interested in promoting projects of particular interest to themselves.

FORTY EMPLOYEES

But with the advent of the gas tax and consequent greater State highway accomplishments and bolder treatment of highway location and construction, it became imperative that the State itself establish its own right of way organization.

The staff consists at present of about forty employees, six of whom have had legal education, the remainder possessing either a special training in right of way, real estate, or appraising practice, or such other business background as will readily adapt them for successful service in this field.

MINIMUM WIDTH

The minimum statutory width of right of way for State highway in California is eighty feet.

However, the State Highway Commission has now prescribed a minimum width of one hundred feet for the trunk lines.

It becomes obvious that, as the minimum statutory width of county roads was only forty feet, the present day widening and altering of these old roads to modern State highway standards is creating right of way problems of major proportions, as a large mileage of the State highway has now become closely built up or bordered by expensive improvements.

The policy of the State is to deal with all

owners "fairly and squarely," but it requires the "tact and contact" of forty trained and experienced men to handle the situation, nevertheless.

SETTLED BEFORE TRIAL

Condemnation proceedings are invoked only after friendly overtures have been unavailing, and even if such proceedings are instituted, a large percentage of them are settled before trial.

The constitution of California was amended in 1918 enabling the State to deposit money security into court when the condemnation proceedings are commenced and to take immediate possession of the desired right of way without awaiting results of a trial.

But despite this summary procedure the right of way agents are admonished to speed up their negotiations to the end that land-owners shall have had ample opportunity to settle before being haled into court and as little personal embarrassment as possible occasioned.

The Division of Contracts and Rights of Way is one of the bureaus of the State Department of Public Works.

HOW THEY WORK

This division is in charge of a chief, who must be an attorney at law, and who coordinates all right of way activities of the department.

The right of way staff consists of two classes; one devoting itself to work largely of a legal nature and the other to visiting those having some interest in the land sought to be obtained and getting their signatures "on the dotted line."

The court work is more directly in charge of the attorney who is usually spoken of as the Attorney for the California Highway Commission and who is aided by three assistants with legal training called "Condemnation Investigators."

The attorney handles all condemnation proceedings and passes upon the sufficiency of all land titles.

The condemnation investigators assist the attorney by acting as his field representatives in settling cases before trial, or in the event

Right of Way Agents Must be Versatile to Operate Successfully

that cases can not be settled, in visiting the localities where the cases are to be tried and preparing for the impending trials by interviewing witnesses and attending to all other necessary preliminary trial work. They must also be qualified to act as attorneys in cases should the attorney be unable personally to handle them due to stress of other duties.

FLYING SQUADRON

Practically the entire time of this legal flying squadron is engaged in the trial of the many condemnation cases in progress in the fifty-eight counties of the State.

Attached to the office of the Chief of the Division of Contracts and Rights of Way are two aides of legal training who are designated as the general right of way agent and the assistant general right of way agent, respectively.

They are the liaison agents of the Chief of the Right of Way Division in his contacts with the district right of way agents. They are subject to orders to go to any part of the State to deal with the legal or even the solicitation phases of the district right of way activities.

DISTRICT OFFICES

The State highway work in this State is handled regionally by ten district offices.

The local right of way activities such as actual field negotiations for necessary rights of way are ordinarily conducted by district right of way agents attached to the district offices. The district right of way agent is in turn aided by several assistant right of way agents.

These district right of way agents form the real backbone of the right of way organization, as upon them largely rests the success and the popularity of the State's endeavors to lay its ribbons of roadway over private property with as little private detriment as possible.

DIPLOMATIC AGENTS

They are the advance agents who, without regard to their own personal comfort or convenience, must constantly be at the wheels of their cars visiting landowners, however far off the beaten path they may find them, smilingly attempting to convince such landowners (some very redoubtable) of their sincerity of

THANKS ARE EXTENDED TO PROPERTY OWNERS

AN EXPRESSION of commendation is due the hundreds of property owners throughout California who are facilitating State highway construction by their donations of necessary rights of way.

Some frankly acknowledge the resultant benefits of the highway betterments to their property, others, at some personal sacrifice, generously contribute the use of their property for the advancement of the community welfare.

The donations have been of two types, those granting required easements without any compensation whatsoever, and those contributing valuable land on the sole condition that the State shall bear the cost of moving existing buildings or pay for any fruit trees affected by the improvement.

purpose and their desire to deal fairly with them.

The "right of way man" has now become recognized in this State as being as essential to an effective State highway organization as the engineer. In fact, a good "right of way man" in the complexities of modern highway construction must be quite a paragon.

ALL-ROUND ABILITY

He must be informed concerning the law of land titles, have at least a rudimentary knowledge of engineering and the ability to read maps and blue prints, able properly to appraise property values, a keen analyst of human nature and the possessor of an agreeable personality and an unswerving integrity.

In closing, may the writer be pardoned for the facetious observation that, despite the trials and tribulations of the "right of way men," theirs must really be a very absorbing vocation, evidenced by the fact that in California they rarely if ever voluntarily resign to enter other lines of endeavor.

IT'S A FUNNY HABIT

Some motorists are so anxious to crash into a railway train that they burst through the guard gates to accomplish this end, it is revealed in reports of the American Railway Association. Approximately one-fourth of the grade crossing accidents in the country last year were due to motorists running into trains. There were 1130 passenger automobiles hit trains last year, killing 214 persons.

Engineers and highway superintendents from Pan-American countries are being trained in American road building methods through a scholarship plan supported by the American Road Builders' Association. Two road builders from each of fifteen Pan-American countries will be appointed in 1931 for six months' study of American highway methods and equipment.

Highway Bids and Awards for June

ALAMEDA COUNTY—Erection and completion of maintenance station buildings near Livermore. Dist. IV, N. H. Sieberg & Son, San Francisco, \$6,489; R. Hodgson & Son, Porterville, \$5,490; Arthur Holyoake, Hayward, \$5,986; C. A. Bruce & Sons, Pleasanton, \$5,654; Wm. Spivock, San Francisco, \$5,828; Oliver S. Amlie, San Francisco, \$6,589; The Minton Co., Palo Alto, \$5,499. Contract awarded to Theodor Johanns, San Francisco, \$5,161.

AMADOR COUNTY—Between Drytown and Amador City. 2.7 miles 20' bituminous surface treatment to be applied. Dist. N, Rt. 65, Sec. E, A. Teichert & Son, Inc., Sacramento, \$5,821. Contract awarded to E. F. Hilliard, Sacramento, \$5,508.

CALAVERAS COUNTY—Between Murphys and Big Trees. About 15.5 miles to be bituminous surface treated. Dist. N, Rt. 24, Sec. E, Heafey-Moore Co., Oakland, \$26,516; Pereira Reed, Tracy, \$20,450; J. R. Reeves, Sacramento, \$21,823; Geo. French, Jr., Stockton, \$20,725; A. Teichert & Son, Inc., Sacramento, \$20,795. Contract awarded to William J. Schmidt, Berkeley, \$17,065.

COLUSA COUNTY—Between Williams and Maxwell. About 8.6 miles to be graded and paved with Portland cement concrete. Dist. II, Rts. 7, Secs. B & C, Basich Bros. Construction Co., Torrance, \$259,263; N. M. Bell, Porterville, \$240,941; Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$259,235; Hanrahan Co., San Francisco, \$235,913; C. W. Wood, Stockton, \$249,544. Contract awarded to Union Paving Company, San Francisco, \$230,247.

COLUSA COUNTY—Between 4 miles south of Williams and Williams. About 4.1 miles to be graded and paved with Portland cement concrete. Dist. III, Rt. 7, Sec. B, C. W. Wood, Stockton, \$125,845; Matt J. Bevanda, Stockton, \$138,496; Hanrahan Company, San Francisco, \$135,673; N. M. Bell, Porterville, \$127,946. Contract awarded to Union Paving Company, San Francisco, \$124,606.

EL DORADO COUNTY—Between Clarks Corner and Placerville. Placing crushed gravel or stone and treating with cut back asphalt by road mix method. Dist. II, Rt. 11, Sec. C, Tiffany-McReynolds-Tiffany, San Jose, \$12,202. Contract awarded to Force Construction Co., Piedmont, \$9,974.

FRESNO AND KERN COUNTIES—Fresno County between west boundary to 2 miles east of Parkfield Junction. 15.4 miles. Kern County between west boundary and 2 miles west of Maricopa to be oiled as a dust palliative. Dist. VI, Rts. 10 and 57, Secs. A and A, B & C, Stewart & Nuss, Fresno, \$3,339; California Crane Service, Los Angeles, \$3,471; Wm. J. Schmidt, Berkeley, \$4,478; Hartman Construction Co., Bakersfield, \$3,777; Kern Construction Co., Bakersfield, \$4,213. Contract awarded to Pacific Tank Lines, Los Angeles, \$3,206.

HUMBOLDT COUNTY—Between Big Lagoon and Freshwater Lagoon. About 8.4 miles to be surfaced with bituminous treated gravel. Dist. I, Rt. 1, Sec. J, Mercer-Fraser Co., Eureka, \$66,184; Heafey-Moore Co., Oakland, \$73,320; W. H. Hauser, Oakland, \$69,920. Contract awarded to Hemstreet & Bell, Marysville, \$64,908.

IMPERIAL COUNTY—Between East High Line Canal and Sand Hills. About 21 miles widening extension pavement with asphalt concrete. Dist. VIII, Rt. 27, Sec. A, Steele Finley, Santa Ana, \$110,877; R. E. Hazard Construction Co., San Diego, \$111,613; Southwest Paving Co., Los Angeles, \$113,072; V. B. Dennis Construction Co., San Diego, \$122,296. Contract awarded to Griffith Co., Los Angeles, \$95,590.

MARIPOSA COUNTY—Between Lorenos on Briceburg grade and El Portal. 12.5 miles to be covered with a bituminous surface treatment of asphaltic road oil and screenings. Dist. VI, Rt. 18, Sec. E, F & G, Wm. J. Schmidt, Berkeley, \$17,225. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$14,646.

MENDOCINO COUNTY—Bridge across Russian River 2 miles south of Ukiah. Two 125' timber truss spans and 8 19' timber trestle spans. 170' roadway approach to be graded and surfaced with bituminous treated crushed gravel or stone surfacing. Dist. IV, Rt. 70, Sec. A, C. Dudley DeVelbiss, San Francisco, \$31,886; W. W. Kitchen, San Francisco, \$33,570; M.

B. McGowan, \$33,596; Smith Brothers Co., Eureka, \$29,677; W. J. Beatty, Castroville, \$33,991; N. J. O'Neil, \$30,502; J. W. Hoopes, Sacramento, \$33,949; Peter McHugh, San Francisco, \$33,141. Contract awarded to A. T. Howe, Santa Rosa, \$28,725.

MENDOCINO COUNTY—Between Piercy and the northerly boundary. About 2.1 miles to be surfaced with untreated crushed gravel or stone. Dist. I, Rt. 1, Sec. K, Smith Bros. Co., Eureka, \$10,993; Tieslaus Bros., Berkeley, \$8,636. Contract awarded to Jas. W. Bertram, Hopland, \$7,131.

MENDOCINO COUNTY—Between Dry Creek bridge and Christine. About 2.3 miles to be graded and surfaced with screened gravel and a timber bridge to be constructed. Dist. IV, Rt. 48, Secs. A, B, Kennedy Construction Co., Oakland, \$75,989; H. H. Boomer, San Francisco, \$68,077; Frank C. Cuffe, San Rafael, \$67,970; Coutoules Construction Co., San Francisco, \$76,635; Chittenden & Howe, Napa, \$83,311; Granfield, Farrar & Carlin, San Francisco, \$71,209; Healy Tibbits Construction Co., San Francisco, \$75,233. Contract awarded to Peter McHugh, San Francisco, \$67,631.

MENDOCINO COUNTY—Erection and completion of maintenance station buildings near Boonville. Dist. IV, Oliver S. Amlie, San Francisco, \$8,935; R. Hodgson & Sons, Porterville, \$5,750; E. G. Hart, San Francisco, \$7,100; J. W. Cobby & Son, San Francisco, \$6,645; Chas. Swanfelt, Ukiah, \$7,000; Wm. Spivock, San Francisco, \$6,200. Contract awarded to Theodor Johanns, San Francisco, \$5,598.

MERCED COUNTY—Between the foot of Pacheco Pass and the easterly boundary. About 37.8 miles to be treated with heavy fuel oil to a width of 3' on each side of the existing pavement. Dist. VI, Rt. 32, Secs. A, B & C, A. Teichert & Son, Inc., Sacramento, \$24,514; Granite Construction Co., Ltd., Watsonville, \$23,419. Contract awarded to Stewart & Nuss, Inc., Fresno, \$12,756.

MONO COUNTY—Between Leevining and 2 miles west of Bridgeport. About 28.4 miles to be treated with heavy fuel oil and cut-back asphalt as a dust palliative. Dist. IX, Rt. 23, Secs. H & I. Contract awarded to Basalt Rock Co., Inc., Napa, \$24,364.

MONO COUNTY—Furnishing heavy fuel oil as dust layer between Deadman Creek and Leevining, and between Junction of Routes 23 and 40 and 5 miles west. 21.1 miles. Dist. IX, Rts. 22-40, Secs. F & G, E. Gilmore Oil Co., Los Angeles, \$6,679. Contract awarded to Pacific Tank Lines, Inc., Los Angeles, \$6,386.

MONO COUNTY—Between Sonora Junction and 4 miles south of Coleville. About 12.9 miles to be surfaced with crusher run base and bituminous treated crushed gravel or stone. Dist. IX, Rt. 23, Sec. K, Clark & Henery Construction Co., San Francisco, \$111,840; Hemstreet & Bell, Marysville, \$138,546; Geo. Herz & Co., San Bernardino, \$106,686; Valley Paving & Construction Co., Fresno, \$212,671; Fred W. Nishbert, Bakersfield, \$115,374; Granite Construction Co., Ltd., Watsonville, \$148,177. Contract awarded to Southwest Paving Co., Los Angeles, \$84,619.

MONO COUNTY—Between Yerby and Casa Diablo Hot Springs. About 12.3 miles to be graded and surfaced with bituminous treated crushed gravel or stone. Dist. IX, Rt. 23, Secs. C & D, George Herz & Co., San Bernardino, \$283,001; Healy Tibbits Construction Co., San Francisco, \$240,987; G. W. Ellis, Los Angeles, \$252,890; Southwest Paving Co., Los Angeles, \$226,048; C. A. Bayles, Biggs, \$259,137; Von der Hallen & Pierson, Costa, \$238,646; Clark & Henery Construction Co., San Francisco, \$274,250; Fred W. Nishbert, Bakersfield, \$288,662; Hemstreet & Bell, Marysville, \$237,226; Gibbons & Read Company, Burbank, \$243,572. Contract awarded to Macco Construction Co., Clearwater, \$235,097.

MONTEREY COUNTY—Between Priest Valley School and the easterly boundary. About 3.2 miles to be surfaced with oil treated gravel. Dist. V, Rt. 10, Sec. C, Tieslaus Bros., Berkeley, \$9,740; Roselip Products Co., San Luis Obispo, \$11,500. Contract awarded to Granite Construction Co., Ltd., Watsonville, \$7,248.

NEVADA COUNTY—Between Truckee and Hinton. About 8.8 miles to be surfaced with crusher run base and bituminous treated crushed gravel or stone (plant

Details of Work Done in Counties

min). Dist. III, Rt. 38, Secs. A & B, Clark & Henery Construction Co., San Francisco, \$179,499; Hemstreet & Bell, Marysville, \$146,622; A. Teichert & Son, Sacramento, \$139,147; Valley Paving & Construction Co., Fresno, \$199,529; Fred W. Nighbert, Bakersfield, \$122,235; Granite Construction Co., Ltd., Watsonville, \$147,395. Contract awarded to Tieslan Bros., Berkeley, \$104,164.

PLACER AND NEVADA COUNTIES—Between Airport and Soda Springs. About 20 miles to be bituminous treated. Dist. III, Rt. 37, Secs. E, F, A & B, George French, Jr., Stockton, \$70,338; Hemstreet & Bell, Marysville, \$65,006; A. Teichert & Son, Sacramento, \$85,813; Force Construction Co., Piedmont, \$69,920; Fred W. Nighbert, Bakersfield, \$79,274; Granite Construction Co., Ltd., Watsonville, \$79,329. Contract awarded to C. W. Wood, Stockton, \$66,380.

SAN BENITO, MONTEREY, SAN LUIS OBISPO AND SANTA BARBARA COUNTIES—Painting traffic stripes for designating traffic lanes. About 254.26 miles. Dist. V, Rts. 2-22, Essick & A, Force Construction Co., Piedmont, \$82,610; Valley Paving and Construction Co., Fresno, \$56,722; A. J. Raisch, San Francisco, \$63,791. Contract awarded to Granite Construction Co., Ltd., Watsonville, \$51,404.

SAN BERNARDINO COUNTY—Through Upland. About 2.2 miles to be graded and paved with asphalt. Dist. I, Rt. 2, Sec. 6, O. Hall Johnson Co., Alhambra, \$128,064; Ed. Johnson & Sons, Los Angeles, \$116,067; Steele Finley, Santa Ana, \$104,351; South-west Paving Co., Los Angeles, \$104,180; Geo. H. Oswald, Los Angeles, \$112,617. Contract awarded to Griffith Company, Los Angeles, \$99,112.

SAN JOAQUIN COUNTY—Between Turner Station and Stockton. About 7.1 miles to be graded, 4.9 miles to be paved with Portland cement concrete. Dist. X, Rt. 4, Sec. E, Clark & Henery Construction Co., San Francisco, \$223,739; Frederickson & Watson Construction Co. and Frederickson Bros., Oakland, \$211,954; Jahn & Bressi Construction Co., Inc., Los Angeles, \$211,392; Hanrahan Company, San Francisco, \$203,116; C. W. Wood, Stockton, \$196,097. Contract awarded to N. M. Ball, Porterville, \$195,801.

SAN JOAQUIN COUNTY—Between Stockton and Turner Station. 9 timber bridges to be constructed and 2 concrete bridges to be widened. Dist. X, Rt. 4, Sec. E, W. J. O'Neil, San Francisco, \$75,925; J. S. Metzger & Son, Los Angeles, \$57,615; Frederickson & Watson Construction Co. and Frederickson Bros., Oakland, \$65,645; R. B. McKenzie, Red Bluff, \$4,082; Geo. J. Ulrich Construction Co., Modesto, \$60,595; M. B. McGowan, San Francisco, \$71,098; Lord & Bishop, Sacramento, \$63,870; O'berg Bros., Los Angeles, \$73,217; Force Construction Co., Piedmont, \$65,270; Bodenhamer Construction Co., Oakland, \$72,662. Contract awarded to Thermolite Construction Co., Inc., San Jose, \$57,537.

SAN LUIS OBISPO COUNTY—About 7 miles north of Paso Robles. 2 C girder bridge across San Marcos Creek, four 40-foot spans on concrete bents and grading and paving approaches with Portland cement concrete. Dist. V, Rt. 2, Sec. A, Neves & Harp, Santa Clara, \$21,608; Oberg Bros., Los Angeles, \$21,514; Robinson Roberts Co., Los Angeles, \$22,740; Lord & Bishop, Sacramento, \$21,953; Hanrahan Co., San Francisco, \$21,929; Bodenhamer Construction Co., Oakland, \$20,692. Contract awarded to L. C. Clark and C. E. Doughty, Visalia, \$20,116.

SAN LUIS OBISPO COUNTY—Between Arroyo Grande and Pismo. About 2.8 miles to be treated with heavy fuel oil on each side of existing pavement. Dist. V, Rt. 2, Sec. E, Rosellip Products Co., San Luis Obispo, \$2,915; Cornwall Construction Co., Santa Barbara, \$3,222. Contract awarded to W. A. Dontanville, Salinas, \$2,755.

SAN LUIS OBISPO COUNTY—Between Atascadero and Paso Robles. About 9.1 miles to be treated with

heavy fuel oil on each side of existing pavement. Dist. V, Rt. 2, Sec. E, Rosellip Products Co., San Luis Obispo, \$4,488; W. A. Dontanville, Salinas, \$10,096; Granite Construction Co., Watsonville, \$10,624; Cornwall Construction Co., Santa Barbara, \$10,907; California Crane Service, Los Angeles, \$11,151; H. E. Cox & Son, Pasadena, \$12,367. Contract awarded to Cook & Clark, Santa Barbara, \$8,637.

SAN MATEO COUNTY—Undergrade crossing S. P. R. R. near Henderson Station. 2 concrete abutments with wing walls, installing drainage system and pumping equipment, grade and pave with Portland cement 0.4 miles roadway. A. J. Raisch, San Jose, \$102,031; Frederickson & Watson Construction Company and Frederickson Bros., Oakland, \$101,273; Healy-Tibbitts Construction Co., San Francisco, \$98,728; M. B. McGowan, San Francisco, \$106,234; Clyde W. Wood, Stockton, \$102,686; Hanrahan Company, San Francisco, \$107,439. Contract awarded to Barrett & Hilp, San Francisco, \$95,188.

SHASTA COUNTY—Between Redding and Fall River. About 59.1 miles to be treated with heavy fuel oil and crusher run base asphalt as a dust palliative. Dist. II, Rt. 28, Secs. A, B, C & D, Granite Construction Co., Ltd., Watsonville, \$14,860; Basalt Rock Co., Inc., Napa, \$14,373; Jack Sasson, Hayward, \$15,267; C. W. Wood, Stockton, \$15,027. Contract awarded to D. McDonald, Sacramento, \$13,154.

SISKIYOU COUNTY—Between 1.5 miles north of Yreka and the Klamath River. About 7 miles bituminous surface treatment to be applied to the existing roadbed. Dist. II, Rt. 3, Sec. C, Dunn & Baker, Klamath Falls, Oregon, \$27,245. Contract awarded to Heafey-Moore Co., Oakland, \$25,702.

SUTTER AND BUTTE COUNTIES—Between Yuba City and Biggs road. About 19.2 miles to be bituminous treated, rock borders. Dist. III, Rt. 3, Sec. A, Clark & Henery Construction Co., San Francisco, \$79,438; Southern California Roads Co., Inc., Los Angeles, \$79,703; A. Teichert & Son, Inc., Sacramento, \$86,278; Granite Construction Co., Ltd., Watsonville, \$86,783; J. E. Johnston, Stockton, \$81,253; Fred W. Nighbert, Bakersfield, \$71,363; Hemstreet & Bell, Marysville, \$86,892. Contract awarded to Jones & King, Hayward, \$68,487.

TRINITY AND SHASTA COUNTIES—Between Weaverville and Tower House. About 32 miles to be bituminous treated. Dist. II, Rt. 20, Secs. A, B & A, Geo. French, Jr., Stockton, \$61,579. Contract awarded to Heafey-Moore Co., Oakland, \$61,223.

VENTURA COUNTY—Girder deck bridge across Santa Clara River. 21 8' spans on concrete piers and abutments. District VII, Rt. 2, Sec. C, Merritt Chapman Scott Corp., San Pedro, \$38,993; Owl Truck Co., Inc., Compton, \$298,530; Oberg Bros., Los Angeles, \$320,749; Union Engineering Co., Ltd., Huntington Park, \$312,274; Macco Construction Co., Clearwater, \$304,156; General Engineering Corp., Ltd., Los Angeles, \$326,288; Herbert M. Baruch Corp., Ltd., Los Angeles, \$303,691; Robinson Roberts Co., Los Angeles, \$34,167; Lynch-Cannon Engineering Co., Los Angeles, \$317,307; H. H. Travers, Los Angeles, \$308,115; Gutleben Bros., Oakland, \$308,116; Rocca & Caletti, San Rafael, \$355,098; Bodenhamer Construction Co., Oakland, \$332,151. Contract awarded to Mitty Bros. Construction Company, Los Angeles, \$282,303.

ARCHITECTURAL AWARDS

For Month of June

CALIFORNIA INSTITUTION FOR WOMEN, near Tehachapi—Administration Building and cottages: Contract for plumbing work to Thomas Haverly Company, Los Angeles, \$17,106; contract for electrical work to R. R. Jones Electric Co., Pasadena, \$6,800.

MENDOCINO STATE HOSPITAL, Talmage—Ward Building No. 14: Contract for general work to Minton Company of Palo Alto, \$47,674; contract for plumbing work to J. A. Fazio, Oakland, \$5,989; contract for heating work to Geo. C. Bell, Oakland, \$3,800; contract for electrical work to Roy M. Butcher, San Jose, \$1,456.

Selfishness Blamed For Large Increase In Auto Accidents

ACCIDENT reports received by the Division of Motor Vehicles for the month of May, 1931, show large increases in the total number of accidents and persons injured. However, the resultant deaths increased less than 10 per cent for the first time since February, 1931.

Reports were received on 2852 accidents involving injury and death. This is 22.88 per cent greater than May, 1930. The number of persons injured in these accidents (4106) is 31.60 per cent greater than last year, while the deaths, which total 218, increased only 7.39 per cent.

For the first time since August, 1930, the number of persons killed in auto versus auto accidents exceeded the number of pedestrians killed. There were 61 people killed in May auto versus auto accidents and 52 pedestrians. These two types of accidents caused 51.83 per cent of all May motor vehicle deaths.

HAD BEEN DRINKING

A total of 4473 drivers were reported involved in May accidents, of which 3766, or 84.20 per cent, were males, 595, or 13.30 per cent, females, while the sex of 112 (2.50 per cent) was not stated.

Forty-two drivers were reported to have been "asleep at the wheel," while 214 "had been drinking."

"Violation of right of way" ranked first in the cause of accidents for which the drivers were definitely responsible. "Excessive speed" was second, "drove off the roadway" third and "driving on the wrong side of the road" fourth. These four causes, all of which are within the control of the drivers, represent 50.88 per cent of the total causes of accidents attributed to the drivers. Three other causes prominent in May accidents were "improper turning," "improper passing" and "slowing down or stopping."

TOLL OF PEDESTRIANS

Pedestrians totaling 669 were involved in May accidents, of which number 52 were killed and 617 injured. As is usually the case, pedestrian deaths were most numerous among young children and elderly people, there being only 14 such deaths between the ages of 10 and 39 years.

Commission Adjourns Out of Respect for Mrs. Toner's Memory

MRS. JAMES A. TONER, daughter of Timothy A. Reardon, California Highway Commissioner, and daughter-in-law of Dr. J. M. Toner, Director of Institutions, died June 24th.

At its regular meeting June 25th, the Highway Commission adjourned out of respect to the memory of Mrs. Toner and passed a resolution of sympathy which was spread upon the minutes of the commission and copies sent Mr. Reardon and Dr. Toner. The resolution said:

WHEREAS, The California Highway Commission, this day in meeting assembled, has been informed of the passing of Mrs. James A. Toner, the beloved daughter of our associate and fellow member, Timothy A. Reardon; and

WHEREAS, The commission desires to express its profound sorrow at the loss suffered by Commissioner Reardon; therefore be it

Resolved, That a copy of this resolution be spread upon the minutes of this commission, and the sincere sympathy and consolation of this commission be offered to Commissioner Reardon and his family in their bereavement; and be it further

Resolved, That when this commission this day adjourns that it shall do so out of respect to the memory of Mrs. Toner.

Most pedestrian accidents occurred at intersections, 247 were injured and 11 killed while crossing intersections in May, the second largest number of pedestrian accidents occurred in the streets between intersections, with 183 injured and 10 killed. Of the 669 pedestrians injured, 22 had been drinking, 3 had physical defects, 42 were confused by traffic, the view of 29 was obstructed, while 62 were reported to have been careless.

Four thousand five hundred sixteen vehicles were reported involved in the 2852 accidents. Of these vehicles 86.56 per cent were passenger cars. Only 117 were definitely reported to have been defective mechanically.

WHEN THEY OCCUR

The peak hour of all accidents during May was from 5.01-6 p.m., while the peak hour of fatal accidents only was 7.01-8 p.m. More accidents occurred on Sundays than any other day of the week. Saturdays were second in the total number of accidents.

Arizona Pays State High Tribute; Will Model After Highway Patrol

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CALIFORNIA has been signally honored by its sister state, Arizona.

Anxious to establish an efficient, up-to-date, thorough organization of highway patrolmen, Arizona has picked this State's police system upon which to model her force.

Following a series of conferences between Superintendent Raymond Cato and Arizona authorities, F. G. Yoder, district inspector and senior instructor of the California Highway Patrol, was chosen for this highly important organization program. He left for his temporary post last month, and will remain in Arizona until he has the new body of men functioning smoothly.

In choosing Yoder to represent this State, Governor James Rolph, Jr., and Chief Cato took into account not only the all-around ability of the inspector, but his fine record as an officer.

The recipient of this signal honor is 39 years old and comes from Orange County. He joined the Highway Patrol in 1923, previous to that time having gained detective and police experience, first with a private detective agency and second with the Santa Ana police department, where he functioned for a year as a patrolman.

Long a student and finally an authority on motor vehicle law and its interpretation, Yoder worked his way up in the State service from patrolman to senior instructor in the training school at Sacramento. There he had a lot to do with teaching officers and men of the California Highway Patrol system the meaning and usage of the State Vehicle Law.

Feeling deeply the honor conferred upon him, Yoder issued the following statement prior to his departure:

"I realize fully, and appreciate, the confidence placed in me by His Excellency, Governor James Rolph, Jr., and Chief E. Raymond Cato. I am also aware of the responsibility to the people of Arizona.

"My only hope is that I may take into the State of Arizona the spirit of the California Highway Patrol and that the friendly feeling now existing between the people of these two states may be broadened by the cooperation of their very similar patrol organizations."



F. G. YODER

Autoists and Press Praise Clean Roads

Clean and unobstructed State highways over the Independence Day holiday period have won high commendation both from autoists and newspapers.

Governor Rolph's order that oiling be stopped on State roads July 3d to permit of easy and comfortable travel during the heavy three-day vacation, aroused much favorable comment throughout the State.

Contractors handling State projects received their meed of praise, too, for their unselfish action in removing, when possible, working equipment from the roads.

Association Approves Proposals Affecting Highway Construction

TWO MATTERS of importance affecting highway construction which were urged by representatives of California—the orderly addition of roads to the State highway system and amendment of Federal Statutes regarding the right of way situation across public lands—were approved by the Western Association of State Highway Officials at its annual meeting held at the St. Francis Hotel in San Francisco on July 10th and 11th.

The subject of additions to the State highway system was presented to the meeting by C. H. Purcell, State Highway Engineer, who explained the procedure adopted in California, whereby additional roads are authorized to be included in the State highway system by the Legislature only after an engineering study by the Division of Highways. These studies, as Mr. Purcell pointed out, are carried on in accordance with certain definite principles laid down by the legislative body and permit a study of cost of construction, traffic to be served, the general development of the locality and the State and the relation of the road to the remainder of the highway system.

ASSOCIATION RECOMMENDS STUDIES

In adopting a resolution of endorsement of this plan, the Western Association went a step further and suggested that the states begin a study of additions to their respective Federal aid systems. The Association favors, before such additions are made, that an expert engineering study be made.

The subject of possessory rights acquired by mining locators on public lands which interfere with rights of way for highways was discussed by Frank B. Durkee, Right of Way Agent, from the headquarters office. The Association adopted a resolution petitioning Congress to enact such additional legislation as may be necessary to protect the rights of the public to highway rights of way, the right to take road building materials from the public domain, and the right of the Forest Service and other departments to prohibit the erection of unsightly billboards and other structures on Federal lands acquired under the

mining laws and under the guise that they are to be used for mining purposes.

Other representatives of the department who appeared before the meeting were C. S. Pope, Construction Engineer, whose paper was entitled "Pavement Construction in 1930: Portland Cement Concrete and Asphalt Concrete," and T. H. Dennis, Maintenance Engineer, who discussed Oiled Road Construction.

CHAIRMAN KELLY WELCOMES DELEGATES

Earl Lee Kelly, Chairman of the California Highway Commission, welcomed the delegates to California upon behalf of Governor James Rolph, Jr., and the Department of Public Works. Governor Rolph sent a letter of greeting, explaining that he was unable to be present because of the funeral of the wife of Lieutenant Governor Frank F. Merriam, which was being held in Long Beach on the day of the opening. A telegram of regret was also received from James I. Herz, Deputy Director, who was also in southern California attending the funeral of Mrs. Merriam.

Chairman Kelly and Commissioner Hopkins attended sessions of the convention which extended over Friday and Saturday. Colonel Walter E. Garrison, Director of the Department of Public Works, was present for a short while on Saturday morning, July 11th, in company with the Congressional delegation, then touring California for the purpose of inspecting the proposed State-wide water development. Colonel Garrison accompanied this delegation during its entire trip through the State.

VISITORS VIEW CALIFORNIA PROJECT

All of the states and territories having membership in the Association were represented except Washington and the Territory of Hawaii. Following the meeting in San Francisco, visiting engineers and officials were taken on trips over California highway projects as guests of the engineers of the Division of Highways.

Definition—A road hog is a motorist who has heard of every automobile accessory except courtesy.



Determined efforts on the part of the Division of Water Resources under Edward Hyatt further to push its water conservation campaign are pictured in the official report of that department for the month of June. Flood control and reclamation activities, tabulation of dam applications and irrigation district news are included in the report which follows:

FLOOD CONTROL

At the request of the Reclamation Board, investigation and surveys were made, design and plans were prepared, and reports submitted to the Reclamation Board on a weir to be constructed in the Wadsworth Canal of Sutter-Butte By-Pass Project No. 6. This office will construct the dam with our own equipment and force at an estimated cost of \$8,730. Materials have been ordered and construction commenced on June 23d.

This weir is to be constructed for the purpose of holding the water surface in the Wadsworth Canal to a higher level to prevent the draining out of surface waters in the territory adjacent to the canals.

Maintenance of Sacramento and San Joaquin Drainage District.—Small crews have been engaged in clearing vegetation out of certain drainage canals and noxious weeds from the levees. The emergency repairs to the Davis weir No. 2 in the Sutter By-Pass were completed on May 27th, at which time the flashboards were put in place. The water was released on April 26th in the evening, and the channel was filled to approximately the same elevation on May 28th.

Owing to the dryness of the season it has been necessary to install four small pumps to care for the willows planted for levee protection on the east Sutter By-Pass levee for a distance of about eleven miles, in connection with which the ditches were cleaned and repaired.

SACRAMENTO—SAN JOAQUIN WATER SUPERVISOR

During the past month the regular field work has continued, comprising measurements of all diversions, stream flow, and return water throughout the Sacramento-San Joaquin territory.

The salinity sampling in the Sacramento-San Joaquin Delta has been extended so that at present samples are being received from forty-seven stations. The accompanying table shows the comparison between 1931 and 1924 stream flow and salinity data. It will be noted that at some of the stations the stream flow is considerably less than it was in 1924 at the same time and also that the salinity encroachment is some-

what in advance of the similar encroachment at this time in 1924.

Station	Discharge in Sec. Ft.			
	1931	1924	1931	1924
Sacramento River at Red Bluff	6/11 2990	6/11 2980		
Sacramento River at Butte City	6/9 1580	6/9 1680		
Sacramento River at Colusa	6/8 1310	6/8 1650		
Sacramento River at Knights Landing	6/8 1080	6/8 1400		
Sacramento River at Verona	6/11 1530			
Sacramento River at Sacramento	6/15 1400	6/15 1260		
Feather River at Nicolaus	6/10 223	6/10 109		
American River at H St. Bridge	6/15 300	6/15 136		
San Joaquin River near Vernalis	6/13 370	6/13 578		
Combined flow of Sacramento River at Sacramento and San Joaquin River near Vernalis	6/13 1710	6/13 1670		

Salinity Tests Sacramento-San Joaquin Delta

Station	Salinity in parts of chlorine per 100,000	
	6/10/31	6/10/24
Bullhead Point	1080	---
O and A Ferry	560	472
Collinsville	380	300
Three Mile Slough Bridge	70	---
Emmerton	84	---
Rio Vista	10	---
Antioch	270	220
Jersey	42	29
Webb Pump	26	---

A meeting of the Permanent Committee of the Sacramento-San Joaquin River Problems Conference was held on May 28th and the water situation was critically reviewed.

The Committee decided that all of the major projects in the Sacramento Valley should be held responsible for waste prevention and conservation and that each should be asked to appoint a Conservation Officer to effect this conservation and to cooperate with the Water Supervisor and officials of the War Department. This recommendation was carried out and the various projects have appointed their Conservation Officers and inaugurated an intensive conservation campaign.

Warnings have been sent out by the Water Supervisor to all of the individual water users under all of the largest projects and to all water users making diversions of any size from the river. These warnings have stated that the rule to be followed is that diversions shall be cut by the amount of waste found under them. During the past week a representative from the War Department and the Water Supervisor have completed an inspection of the control and use of water on nearly all of the larger projects in the Valley.

It was found that, on the whole, a sincere effort is being put forth on the part of the water users to cut down waste, and with the placing in effect of additional steps recommended to the various districts by the Water Supervisor, it is felt that

Flood Control and Reclamation Details

Continued from preceding page

everything possible of accomplishment through waste prevention and conservation will have been done.

It remains to be seen whether or not a further drop in stream flow will require other additional regulations in the nature of a schedule, prorating the supply, etc.

COOPERATIVE SNOW SURVEYS

The work on this project during the past month has comprised almost entirely office studies in relating stream flow and precipitation to run-off. In each major stream basin, the stream flow stations now being maintained which would best reflect the snow run-off are selected for the various partial areas and sub-basins. The computations are then made to obtain for each of the stations selected an estimated long-time run-off record. This estimate is made by comparison with the actual long-time record at the principal gaging stations. With an estimated long-time stream flow record at each station, tentative normals for the water content at the various snow courses can be computed by comparison with the run-off data.

Some office work has been done in taking off the areas of the elevation zones into which the various basins are divided. These areas are required in the reduction of the snow measurements to obtain a weighted mean water content for a sub-basin.

Plans for the next season's work are being formulated and a budget has been prepared which permits of the addition of a few more snow courses in some of the basins and a small extension of the work.

A trip was made for conference with the members of the Nevada Cooperative Snow Survey Committee relative to forecasts and data in connection with the eastern slope basins.

WATER RESOURCES

Napa Valley Investigation.—Napa River and Conn. Rector and Day Creeks have been measured regularly and the water levels taken in a number of wells throughout Napa Valley.

South Coastal Basin Investigation.—This investigation has continued in a routine way throughout the month. Of special interest in this work is the report which was completed on work necessary to determine the possibility of salt water intrusion along the Orange County coast and which is to be presented to the Orange County Cooperative Committee at an early date.

WATER RESOURCES REPORTS

Satisfactory progress has been made in completing the reports on the water resources investigations covering the State Water Plan for the coordination, develop-

ment, conservation and utilization of the water resources of the State, authorized under the provisions of Chapter 832 of the Statutes of 1929.

IRRIGATION

While the numerous showers during the month in the Central Valley resulted in some damage to maturing berry, fruit and grain crops, they will to a limited extent relieve the shortage of irrigation water.

Field visits for conference or inspection of works were made to the La Canada, South Montebello and Walnut irrigation districts in Los Angeles County; the Santa Fe, San Dieguito, Vista, Fallbrook, Ramona, Lakeside, San Ysidro and La Mesa, Lemon Grove and Spring Valley irrigation districts in San Diego County; the Carpenter, Serrano, Newport Heights and Newport Mesa irrigation districts in Orange County; the Beaumont and Palo Verde irrigation districts in Riverside County; the Hollister irrigation district in San Benito County; and the Merced and El Nido irrigation districts in Merced County.

About 5 per cent of the excavation and 40 per cent of the structures remained to be built on June 1st to complete the irrigation system of the El Nido irrigation district.

At a meeting of the California Bond Certification Commission held on June 17 at San Francisco, an expenditure order of \$900 by the Thermalito irrigation district was approved for developmental purposes within the district.

Agreements between the Corcoran irrigation district and Meridian Limited and the Guaranty Investment Company, corporations, for the lease of certain wells by the district to be installed and equipped by the corporations on land owned by them in the district, and to yield 32 second-feet of water, were approved.

General discussion was had by the Commission relative to the plans for refunding present bond issues by several of the irrigation districts in the State.

DAMS

During June efforts have been made to get to dams in the High Sierras which are accessible for only a few months in the year. An endeavor is being made to have repairs completed on all existing dams this season.

To date 763 applications for approval of existing dams are on file; 70 for approval of plans and specifications for construction or enlargement and 156 for approval of plans for repairs or alterations.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF DAMS

Dam	Owner	County
White House Creek	Humphreys Estate Inc.	San Mateo
Verdugo Wash	L. A. County Flood Control District	Los Angeles

\$5,770,000 Dam Wins Approval of State

Continued from page 40

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS FOR REPAIRS OR ALTERATIONS

Dam	Owner	County
Spaulding	R. D. Craig	Modoc
Big Santa Anita	L. A. County Flood Control District	Los Angeles
Swanzy Lake	Calif.-Hawaiian Sugar Refining Corp.	Solano
San Jacinto	A. C. Agee	Riverside
Hall Canyon, Lower	Associated Oil Company	Ventura
Devils Gate	L. A. County Flood Control District	Los Angeles

PLANS APPROVED FOR CONSTRUCTION OR ENLARGEMENT OF DAMS

Dam	Owner	County
Pine Canyon	City of Pasadena	Los Angeles
Lower Lindsay	Pacific Gas and Electric Co.	Nevada

The City of Pasadena on September 30, 1930, filed application, as provided for in the law governing the supervision of dams, with the State Engineer for approval of plans and specifications for construction of a concrete dam at Pine Canyon Site Number 2 on the San Gabriel River about four miles upstream from Azusa, the reservoir back of this dam to have a storage capacity of about 64,000 acre feet.

On March 18, 1931, the city filed an amended application in lieu of the one filed in September. Under the amended application it is proposed to construct a dam of the same type at the same location but 50 feet less in height than that originally contemplated. The reservoir storage capacity would be reduced from 64,000 acre feet to about 40,000 acre feet under the new proposal.

Because of the magnitude, importance and many technical considerations involved in the proposed construction, the State Engineer appointed a Consulting Board consisting of preeminently qualified geologists and engineers to advise on the safety features of the dam and appurtenant structures. Based on the findings and conclusions of the Board together with careful study by the department, the State Engineer approved the City's amended application June 2, 1931.

The estimated cost of the dam, exclusive of conduits and other features of the project, is given by the city as \$5,770,000.

PLANS APPROVED FOR REPAIRS OR ALTERATIONS

Dam	Owner	County
Folsom	Pacific Gas and Electric Co.	Sacramento
Big Santa Anita	L. A. County Flood Control District	Los Angeles
Sardine Lake	Archibald Farrington	Mono
Lower Hall Canyon	Associated Oil Company	Ventura

WATER RIGHTS

Twenty-two applications to appropriate water were received during May, thirty were withdrawn or canceled, and twenty-four were approved. Eleven permits were revoked and fifteen passed to license.

Among the applications received were seven for mining purposes, including two rather large ones—one by Wm. F. Bickel of Auburn to appropriate 25 cubic feet per second from Mill Creek in Sierra County and the other by Geo. W. Lischer of Camptonville to appropriate a like amount from Willow Creek in

Yuba County. A third application of unusual importance was received from Geo. L. Dodds et al., seeking an appropriation of 10 second feet and 10,000 acre feet from Escondido Creek in San Diego County for irrigation and domestic purposes.

Among the more important applications approved were the following:

Two by the City of Monrovia allowing 10 second feet and 1000 acre feet per annum from Sawpit Canyon for municipal purposes.

Eight by the County of Los Angeles for the benefit of Los Angeles County Park.

One by El Dorado Irrigation District allowing 5000 acre feet per annum from Weber Creek in El Dorado County for irrigation, the estimated cost of development being \$450,000.

One by Santa Cruz Development Company allowing 3.5 second feet from Branciforte Creek in Santa Cruz County for domestic purposes on summer home subdivision, the estimated cost of the development being \$100,000.

Inspection of projects under permit in Sacramento, San Joaquin, Tuolumne, Stanislaus, San Mateo, Santa Clara, Santa Cruz, and Monterey counties was completed for the current season.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). Case pending in the Superior Court of Shasta County, awaiting the court's pleasure in placing it on the calendar.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). Case pending in Superior Court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County). Division's report as referee submitted to the Superior Court on May first.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). More than eighty per cent of the water users have signed the stipulation for consent judgment which was presented at the conference held at Lake City on March 17, 1931. The stipulation is now being circulated among the non-resident parties.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted at the conference held at Cedarville on March 16, 1931.

Franklin Creek (Modoc County). Administration of the schedule of allotments for trial distribution during the 1931 irrigation season was continued throughout the month.

HERE'S SOUND ADVICE FOR EVERY EMPLOYEE

WE are now in the midst of the vacation season—our peak period of traffic. Those using the roads at this time are on pleasure bent, touring the coast, valley and high mountain regions.

It should be the aim of our entire organization to exercise every precaution for the safety of this traffic, and by uniformly courteous treatment contribute our share towards their thorough enjoyment of this period.

* * *

(Instructions issued June 25 by Charles H. Purcell, state highway engineer, to employees of the Division of Highways.)

REPORT SHOWS WORK DONE BY WATER DIVISION

(Continued from page 41.)

New Pine Creek (Modoc County). Field work on the investigation of the water supply and use of water on New Pine Creek was continued throughout the month.

Eagle Creek (Modoc County). The case of Arthur J. Harris et al., vs. Sarah L. Adams et al., involving the determination of the water rights on Eagle Creek, Modoc County, was referred to the Division by the Superior Court on May 13, 1931. A field investigation of the water supply and use of water from the stream was commenced immediately following the reference and has been continued throughout the month.

WATER DISTRIBUTION

Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl, Pine and Soldier Creeks (Modoc County). Water master service on these streams was continued throughout the month.

Pit River (Modoc and Lassen Counties). Supervision of diversions from Pit River in Big Valley and in Hot Springs Valley was continued throughout the month.

North Cow, Oak Run and Clover Creeks (Shasta County). Water master service on these streams was continued throughout the month.

Little Shasta River (Siskiyou County). Water master service on this stream was continued throughout the month.

Lower Shasta River (Siskiyou County). Water master service on this stream was commenced June first.

MANY MOTOR LAWS

The average citizen and his automobile received more attention during the recent sessions of various state legislatures than any other phase of human activity. This is indicated by reports received by the Automobile Club of Southern California, showing that more than 6500 bills were introduced in the 48 states, an average of more than 100 per state, pertaining to motor vehicle traffic.

A manufacturing genius is a man who makes a commodity just strong enough to hold together until the last installment is paid.—*Judge.*

Lodge Will Set Up Tablet as Marker For Historic Spot

RESPONDING to a request of the Grand Lodge of Odd Fellows, California, members of the staff of the State Highway Division have been in conference with officers of the fraternity at a point on the Kit Carson trail, near Red Lake, as to the location of a particularly interesting marker which the order proposes to erect.

It seems that in the year 1849 there was some competition between the Masons and Odd Fellows for installation of the first lodge in California. A party of Odd Fellows from the east bearing a dispensation to form a lodge, pushed over the ridge and as soon as they were satisfied that they were within the California line, they proceeded to paint the names and dates of their arrival on large rocks.

ROCKS ARE MARKED

Using what appears to be a white lead solution, they printed their names and the date, August 4th, very clearly on the rocks. Until recent years all the names were legible but they are now fading. Some, in more protected places, are fairly clear.

The Grand Lodge has, by resolution, authorized insertion of a bronze tablet in one of the rocks and erection of a large pillar where the pioneers camped. The officers asked Walter E. Garrison, Director of Public Works, to assure the location as against road changes and as to easement.

FIND PARKING SPACE

The director sent the staff members to investigate and report. They found that by providing a crossing across a small gully and clearing some space, an excellent parking place may be made at the site. It is near both Tragedy Springs and the Kit Carson marker.

ENGINEERS TO MEET

Plans are under way for the 1931 convention of the American Association of Engineers, which is to be held at Huntington, West Virginia, on September 28, 29 and 30. The Huntington Chapter will act as host to the delegates and a cordial invitation is extended to all engineers interested in the social and economic side of the profession to attend this meeting.

Read this one according to sex—"What does it mean when that man (lady) sticks his (her) hand out the way he (she) does?"

"That he's (she's) going to turn to the right, or to the left or go straight ahead."

State Prison Camps Give Hope To Men And Assist In Their Regeneration

By **FRED R. SEYMOUR**, Supervisor, Prison Road Camps

WHY DO WE put people in prison? Is it a form of collective revenge which society imposes on those who violate its rules, a studied plan for rehabilitation, or the easiest way to handle a perplexing problem? I believe the latter is the basis of our penal system, which is, perhaps, the most outstanding failure of our modern civilization. This great problem, involving a stupendous economic and social loss, is not alone a responsibility of government, but is a problem which rests on the shoulders of every citizen, and will not be solved until met squarely without evasion.

These men are not in prison of their own volition, but because we put them there, and why? To eventually release them with the expectation they will become good citizens and helpful to society, due to rehabilitation during the period of imprisonment, or release them more hardened, more resentful, and more determined to be outlaws of their kind? It seems obvious that any form of imprisonment which does not contemplate the regeneration of the criminal is but adding another crime by society to the many committed by individuals.

I believe the only panacea is work—not the mentally degrading and nonobjective toil of breaking up rocks with hammers, energizing toil over rows of noisy, dusty and unhealthful jute looms, or manufacturing commodities to be sold on the open market in competition with free labor, but rather work that takes those who have earned the privilege, by a period of good behavior inside, away from the prison walls into the great outdoors; healthful, interesting and constructive work that upbuilds physically and spiritually. I believe that worthwhile work in close contact with nature is the surest way to bring surcease to troubled, embittered and vengeful

souls, to develop self-confidence, ambition, and restore pride.

Idealistic? Yes, but practical, as evidenced by the success of California prison road camps, to which vacationists are indebted for many hundreds of miles of broad highways into wonderlands of nature. These are honor camps, where the men are well housed, well clothed and well fed. Assignment to the camps is a privilege, which must be earned by an extended period of good work and good conduct inside. A wage is paid, from which are deducted individual expenses, thus encouraging economy. The average prisoner leaves camp with \$80 to \$100, a sufficient amount to finance him in securing employment. Additional time credits, amounting to one day for each two days in camp are granted road workers.

These men, or rather boys, for most of them are under 30, are in trouble largely due to lack of training in honest labor. Many arrive at camp with considerable misgiving as to their ability to survive hard work, and later derive considerable pride from the knowledge of their physical fitness and the fact that work is not necessarily fatal.

The influence of the road camp in preserving discipline within the prisons can

not be overestimated, as the majority of the men are striving for a record which will enable them to receive road camp assignment. Unfortunately, however, the number that can be so used is but a small percentage of the total prison population, and many deserving men are doomed to lose the benefit of this experience. A possible way of extending this work of rehabilitation may be in a State plan of mountain reforestation, where honor camps could be established to supply the labor.

The individual may ask, where does my responsibility lie, and what can I do to help



FRED R. SEYMOUR

solve this problem? I would first suggest a mental readjustment to the understanding that convicts are not a peculiar species unlike ourselves, but are the brothers and sons of our friends and neighbors, with hopes, loves and ambitions such as our own. We can help by giving jobs to men paroled and discharged, and assist them with honest friendship and encouragement, without unreasonable expectations.

It is of vital importance to eliminate from the mind of the man who has "done time" a sense of persecution and continued public condemnation. He personally feels he has discharged his debt and is entitled to a fresh start.

We can help by encouraging the enactment of more enlightened legislation, and discourage foolish legislation to curtail individual liberty and responsibility.

Perhaps a little more consideration for our neighbors' problems and a little help and encouragement when most needed will contribute greatly to the reduction of our prison population.

CALIFORNIA'S RECORD IN MOTOR CAR OWNERSHIP

California stood second to New York in the number of passenger cars, taxicabs and buses licensed during the year 1930, according to a tabulation put out by the United States Bureau of Public Roads. Out of 23,000,000 registrations for these types of vehicles, California had 1,810,000, while New York had only 150,000 more.

California, too, showed one of the highest percentages of increase over 1929, the record for the Golden State being 3.4 per cent on a total increase of 67,000 over the previous year. Throughout the Nation the gain over 1929 was only .08 per cent in total motor vehicle registration.

If motor trucks are added, California and New York were the only two states to have more than two million licensed motor vehicles in operation last year. The number of trucks in California numbered 230,900, approximately 100,000 less than were operated in New York State.

CROSSING ACCIDENTS DROP

Grade crossing accidents in California during the first five months of 1931 totaled 967, a decrease of 19.6 per cent below the 1930 figure of 1202, according to report compiled by Joseph G. Hunter, Transportation Engineer of the Railroad Commission.

"The sedan," he says, "was parked at the side of the road, and as I drew near I could hear noises of a struggle within. I could hear a rustle, probably of silk, and the muffled panting of a man. The body of the car swayed slightly to and fro. I heard a curse, and then, again, the muffled panting. I crept softly around to the side, looking into the window, and saw—

"A man trying to fold a road map the same as it had been!"

New and Used Auto Sales Increase Says Col. Snook's Report

THE general public is buying both new and used cars in much greater quantity than a year ago!

That is the conclusion reached by the Division of Motor Vehicles in its monthly report to the Director of the Department of Public Works.

Colonel Snook reports that there is an increase in registrations against the first five months in 1930 of 39,515, of which 27,217 were classed as PLEASURE CARS.

An increase is also shown in the number of transfers handled as of May 31st. In 1930 there were handled by the division 462,874 transfers, whereas in the same period this year 484,736 were made, an increase of 21,862.

Altogether the division has collected for the first five months of this year \$8,638,851 in motor vehicle registration fees.

During the month of May 6637 nonresident permits were granted, bringing the total number for 1931 to 27,741, an increase of 396 over the same period of 1930.

ROAD TROUBLE IN ARIZONA

(From *Arizona Highways*)

A northern Arizona road patrol foreman, upon being relieved of his duties, was asked to turn in a report of equipment, etc., which he was turning over to the new foreman. The auditor received the following report:

Feb. 4, 1931.

"I hereby transfer to the new Patrol Foreman the following:

A miscellaneous bunch of equipment, some good, some bad, with all attachments and accessories that have not been removed or stolen.

I also transfer certain animosities not mentioned herein but later by devious means will be made known to the new Patrol Foreman.

Also a certain amount of grief caused by wrong clerical reports, indifference to the job, talking too much and jealousies among his hired help.

Also seventy-four miles of road on which he may slave, work and sweat twenty-four hours a day if he wishes, but it will be the same old road.

I also transfer to him my salary, this being the only transfer that I regret.

Signed: Old Patrol Foreman."

The average citizen and his automobile received more attention during the recent sessions of various state legislatures than any other phase of human activity, the Erskine Traffic Bureau of Harvard University showing that more than 6500 bills were introduced in the forty-eight states, an average of more than 100 per state, pertaining to motor vehicle traffic.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

EARL LEE KELLY, Chairman, Redding

HARRY A. HOPKINS, Taft

TIMOTHY A. REARDON, San Francisco

PHILIP A. STANTON, Anaheim

FRANK A. TETLEY, Riverside

C. H. PURCELL, State Highway Engineer, Sacramento

ERIC CULLENWARD, Secretary

HUGH K. McKEVITT, Attorney, San Francisco

HEADQUARTERS STAFF, SACRAMENTO

G. T. MCCOY, Principal Assistant Engineer

L. V. CAMPBELL, Office Engineer

T. E. STANTON, Materials and Research Engineer

FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Chief Accountant

DISTRICT ENGINEERS

F. W. HASELWOOD, District I, Eureka

H. S. COMLY, District II, Redding

CHARLES H. WHITMORE, District III, Sacramento

J. H. SKEGGS, District IV, San Francisco

L. H. GIBSON, District V, San Luis Obispo

E. E. WALLACE, District VI, Fresno

S. V. CORTELYOU, District VII, Los Angeles

E. G. SULLIVAN, District VIII, San Bernardino

F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

DIVISION OF WATER RESOURCES

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J. J. HALEY, Jr., Administrative Assistant

HAROLD CONKLING, Deputy in Charge Water Rights

A. D. EDMONSTON, Deputy in Charge Water
Resources Investigation

R. L. JONES, Deputy in Charge Flood Control and
Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams

SPENCER BURROUGHS, Attorney
EVERETT N. BRYAN, Hydraulic Engineer, Water
Rights

A. N. BURCH, Irrigation Investigations

H. M. STAFFORD, Sacramento-San Joaquin Water
Supervisor

GORDON ZANDER, Adjudication, Water Distribution

KATHERINE A. FEENY, Chief Clerk

MABEL PERRYMAN, Secretary

S. T. HARDING, Irrigation and Special Investigations

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P. T. POAGE, Assistant Architect

W. K. DANIELS, Deputy Chief of Division

HEADQUARTERS

H. W. DeHAVEN, Chief Architectural Draftsman

C. H. KROMER, Structural Engineer

CARLETON PIERSON, Specification Writer

C. O. PALM, Chief Clerk

C. E. BERG, Engineer, Estimates and Costs

J. W. DUTTON, General Superintendent Construction

W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

W. M. CALLAHAN, Electrical Engineer

DIVISION OF MOTOR VEHICLES

FRANK G. SNOOK, Chief

E. RAYMOND CATO, Superintendent of California
Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

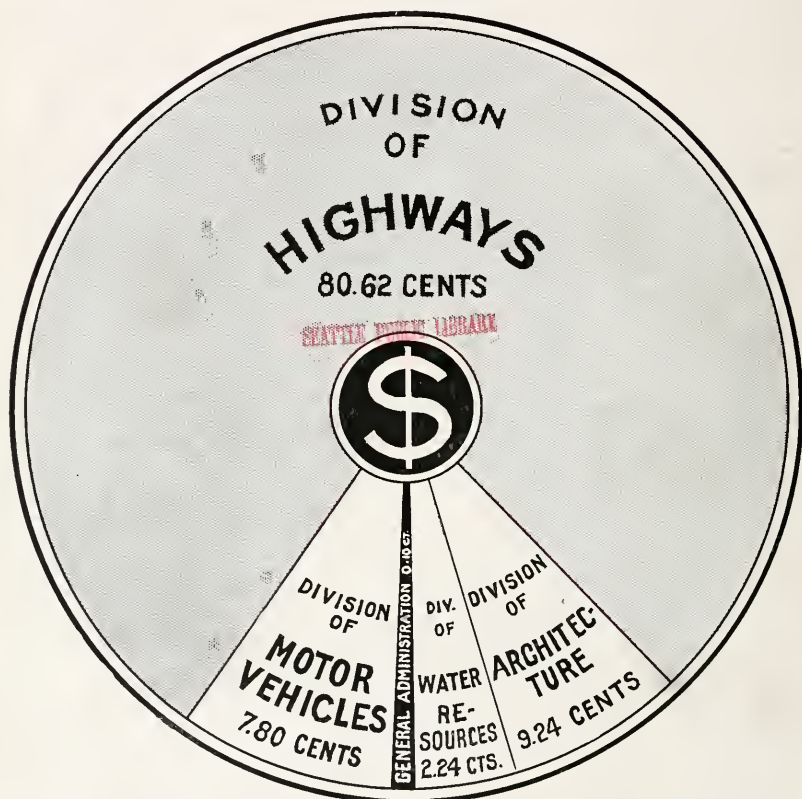
Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

How your Dollar is spent

By the
State Department of Public Works.



			Per cent
General Office Administration.....	\$40,000 00	-----	0.10
* Division of Architecture.....	\$3,690,000 00	-----	9.24
Division of Water Resources.....	\$895,000 00	-----	2.24
Division of Ports.....	\$3,050 00	-----	---
Division of Motor Vehicles.....	\$3,115,500 00	-----	7.80
Registration.....	\$1,496,000 00	-----	\$3 75
California Highway Patrol.....	\$1,619,500 00	-----	\$4 05
Division of Highways.....	\$32,206,555 74	-----	80.62
Administration.....	\$1,035,178 57	-----	\$2 59
Maintenance.....	\$5,472,452 59	-----	\$13 70
Construction and Reconstruction.....	\$25,698,924 58	-----	\$64 33
Totals.....	\$39,950,105 74	-----	100.00

* Includes special appropriations for permanent improvements, expenditures, supervised by the Division of Architecture.

This analysis is of expenditures for year ending June 30, 1931.

CALIFORNIA HIGHWAYS and PUBLIC WORKS

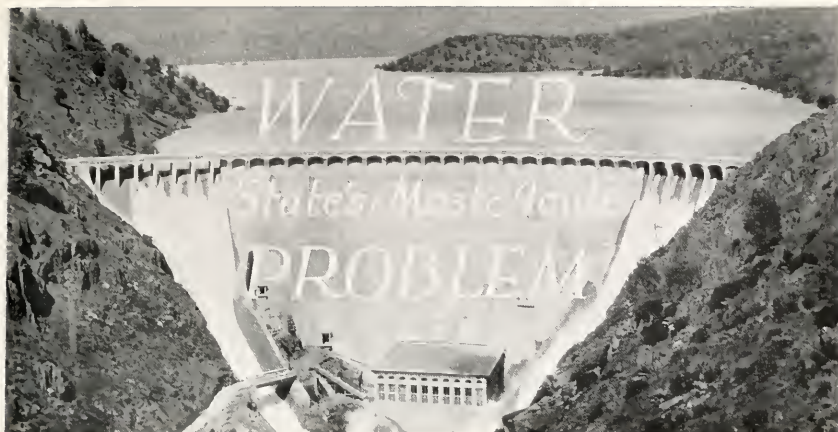
An aerial photograph of a dense forest. A river flows through the center of the image, with a small bridge crossing it in the upper right. The forest is composed of tall, thin trees, and the river is surrounded by lush vegetation.

*Along the highway~
where Spanish Creek
flows near Keddie.*

LAWTON AND McCLURE LTD. S.F.

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GOVERNOR ROLPH has announced the appointments of nine members of the California Water Resources Commission and has designated the Honorable Matt. I. Sullivan of San Francisco, former Chief Justice of the Supreme Court of California, as chairman of the commission. The other members are:

D. K. Barnell of Merced.
James M. Burke of Visalia.
Shannon Crandall of Los Angeles.
Judge Francis Carr of Redding.
R. C. Harbinson of San Bernardino.
W. B. Mathews of Los Angeles.
Jesse Poundstone of Grimes.
A. M. Tarpey of Fresno.

In appointing this commission Governor Rolph addressed a message to the People of California, calling attention to the seriousness of the water problem and the necessity for its early solution and called upon the citizenry of the State to consider earnestly and carefully the situation in order that an equitable solution be made to the end that the progress of California may continue unhindered.

His message says in part:

“I am addressing you at this time on an undebatable question that is of vital importance to each individual and every interest in California. It affects the present and future welfare and prosperity of the entire State. It is California's water problem. Nearly every section of the State has felt the effect of the water shortage that has come upon us during the long period of drought of the past several years.

“A real emergency exists. An equitable, constructive and immediate solution of the problem is essential to future well-being of the State. I consider it the paramount duty of the State and each citizen thereof to make every effort to bring about such a solution.

“During July, an important congressional committee, the House of Representatives Subcommittee on Appropriations for the Department of the Interior, spent twelve days making a study of the water needs and conditions of California and were strongly impressed with the seriousness of the water situation. At the conclusion of the trip Chairman Murphy of the committee very concisely expressed the thoughts of the committee as follows:

“I hope that you will start a campaign for the saving of the lives of the people of this State, the saving of their very estates, a campaign to save your State. It is just that serious in the minds of the members of our committee. I bespeak for you the hearty cooperation of every wide-awake citizen of the great State of California to grapple with this thing that is creeping upon you, that may destroy you.”

VISION AND ABILITY

“* * * I have given careful thought and serious consideration in selecting the members for the California Water Resources Commission, and have appointed men of broad vision and of outstanding ability in public affairs who will have the best interests of the entire State in mind when considering this most important question. * * *

(Continued on Page 16)

22,000 Smiths, 16,000 of Jones Family Keep Girls Hopping for Auto Data

By B. A. TRAVIS, Assistant Chief Clerk, Department of Motor Vehicles

"HELLO! Is this the Department of Motor Vehicles?"

"Yes, sir."

"This is the police department of ——. We are trying to locate the owner of a car with license plates numbered ——. He ran over a man and went on without giving aid. Please tell us who he is and where he lives."

"Hold the line, please."

This little scene is repeated with variations many times daily in California. And the chances are ten to one the information will be secured and given the officer in less than a minute.

How the Department of Motor Vehicles keeps the records on more than 2,000,000 cars in the State so that information concerning the license numbers, registered and legal owners and engine numbers of any one of them may be obtained in a few seconds is a story of its own.

It was a simple matter a few years ago when the records of all cars in the State could be filed in a single room. But within a decade, registrations have leaped to such enormous proportions that an entire floor is required at Sacramento to keep the files of a single year.

The record of every car in the State, whether used for pleasure or business, owned by a private individual or public body is kept on a three-way system as follows:

1. Alphabetically, by name of the registered owner.
2. Numerically, by number of license plate.
3. Numerically, by number of engine.

In addition to the complete files kept in Sacramento, duplicate license plate files are maintained in San Francisco and Los Angeles, principally for the accommodation of peace officers interested in checking up "hit and run" drivers, stolen cars or in getting all the innumerable kinds of information about cars the officers need.

Twenty-four hour telephone service is maintained at the Sacramento and Los Angeles offices so that anyone may call in by day or night and receive the information desired. Trained operators are kept on the job so that it rarely requires more than a minute to get the information from the files and give it to the party wanting it.

The engine number file is known as the "master file" because it gives complete information concerning the owner, the license number, engine number and the legal owner of the car.

For police purposes, however, the license number file is by far the most valuable, since the officer seeking information about a given vehicle usually has only the number on the license plate. Hundreds of "hit and run" drivers are apprehended annually by this means.

"Does John Smith or Bill Jones own a car, and if so, what is the number?"

This is a question frequently asked. It might be hard to answer, for there are more than fifty John Smiths in the files and as many Bill Joneses. But usually the inquirer knows the address of the party or at least something about him that will

enable the operator to pick him out from the others.

The file will not only show the kind of car Bill Smith owns. It will also show the license number, the engine number, who Bill Smith bought it from and when.

Likewise, if Bill Smith sells his car the record will show to whom it was sold and when. Some cars change hands as many as five times in a single year. These changes are noted carefully in the record so that it would be impossible almost for anyone to impersonate Bill Smith and get away with it.

The magnitude of keeping the records is best evidenced by the fact that there are more



B. A. TRAVIS

"YOUR NUMBER?"—But it's auto license or engine numerals they're talking about when these girls of the Motor Vehicle Department answer the hundreds of "hurry-up, I-need-information" calls which are received by the department weekly. Here we have Sophie Svetich handing the query to Luella May Shubert, who rushes it to the filing cabinet workers seen below.



ALL BUT THE FINGER PRINTS—There's very little about your car that isn't on file at Sacramento. And it takes less than one minute to supply information concerning the same.

State Takes Over 722 Miles of Roads For Maintenance in Secondary System

SEVEN hundred and twenty-two miles of county roads were taken into the State Highway system for maintenance August 14.

This mileage becomes part of the secondary State Highway system under Senate Bill 46 passed at the last session of the Legislature.

Sponsored by Senators Nelson and Edwards of Orange, and Chester M. Kline of San Jacinto, the measure directs the Department of Public Works to "lay out and construct highways by the most direct and practical routes between present State Highway termini."

This clause will necessitate future abandonment of certain portions of the routes selected. Consequently boards of supervisors of the various counties in California were asked by the State Highway Commission to approve a resolution which obligates those counties to "resume full control and responsibility for such portions of county road as shall not be included within the layout of said State Highway as finally laid out, adopted and constructed."

\$1,109,600 FUND

The Highway Commission makes the point that what might at this time be the "most direct and practical" route may not be found so when general reconstruction work is begun at a future date.

There has been set aside in the budget \$1,109,600 for maintenance and reconstruction for the next two years.

"Present maintenance crews will handle the new mileage in so far as possible to the end that every available penny may be spent in maintaining a high standard of road," declares T. H. Dennis, maintenance engineer. "Future reconstruction must necessarily be carried out as the demands and funds for secondary roads will permit. One new State maintenance station will be established on the Inland Route."

Addition of these secondary roads followed passage of a Senate resolution providing, in part, that the Department of Public Works make a study of traffic on roads not then in the State Highway system which, either by

Following is a tabulation by counties, north and south, showing the mileage of secondary roads taken over August 14:

NORTH		Miles
Contra Costa	-----	10.65
Lassen	-----	4.60
Modoc	-----	37.40
Napa	-----	5.10
Plumas	-----	55.80
Siskiyou	-----	65.10
Solano	-----	4.50
Total	-----	183.15
SOUTH		Miles
Imperial	-----	10.05
Inyo	-----	9.16
Kern	-----	65.80
Los Angeles	-----	30.65
Mono	-----	37.79
Orange	-----	25.40
Riverside	-----	124.60
San Bernardino	-----	56.80
Santa Barbara	-----	39.80
San Diego	-----	71.30
San Luis Obispo	-----	33.85
Ventura	-----	34.40
Total	-----	539.60

reason of the large volume of State traffic which they were carrying, or by the relief that they would afford to heavy traffic upon present State highways, or as highways serving as important interstate links, might properly be included and added to the State Highway system.

ONE YEAR'S STUDY

The resulting report, completed by the Survey and Plans and Maintenance Departments, carried definite recommendations on the roads to be included, based on a year's field study of the traffic, topographic and economic features of various routes considered.

The 1931 session of the Legislature adopted these recommendations which were embodied in Senate Bill No. 46 which provided that: "The Department of Public Works is hereby authorized and directed to lay out and con-



THERE ARE SMILES that make them happy. Immediately above are Highway Commissioners at the end of a hard day's meeting. From left to right, Harry A. Hopkins, Frank A. Tetley, Earl Lee Kelly, chairman; Timothy A. Reardon and Phil A. Stanton. Smiling because they don't have to inspect their roads as did the gentlemen on top, Messrs. R. C. Irvine in the buckboard and J. L. Maude. They were of the Bureau of Highways. The picture was taken in Riverside County in 1896, and, to quote from Ben Blow's book, "California Highways," they drove seven thousand miles in this rig inspecting roads in every county in the State. James, my sports roadster.

\$41,000,000 Cost of State Building!

Method of Laying Out Work Explained

By GEO. B. McDOUGALL, Chief, Division of Architecture

DURING the 20-year period, 1913 to 1933, the State of California will have constructed at about 50 different locations, buildings and other structures and engineering works to serve these structures, of a total value of approximately \$41,000,000 and involving about 2000 different projects.

About \$16,000,000 was expended during the first 12 years of the 20-year period and \$25,000,000 will have been expended during the last eight years.

The architectural and engineering work involved has been done by and under the direction of the Division of Architecture of the State Department of Public Works.

PROVISIONS OF LAW

The law provides three means for doing this work:

The architects in two cases, the San Francisco State Building and the Sacramento State Buildings known as the Capitol Extension Buildings, were selected by means of public competition conducted by the State Architect under the provisions of section 11 of the State Building Act.

Architects in private practice have handled and are handling 28 projects as authorized by an act of the Legislature of 1929 known as Chapter 291, 1929.

All the remainder have been and are being handled by the Division of Architecture itself.

DIVISION UNIQUE

The Division is unique as an architectural and engineering organization for building design and construction in that it includes within itself all the services involved in starting with a vacant site and developing a complete institution ready for occupancy to accommodate from 200 to 3500 persons as the case may be.

When the number of sites under consideration for a particular institution has been reduced to four or five the Division is called upon to make preliminary general surveys as to building sites, water, electric and gas supplies and possibilities for sewage disposal. When the site has been selected and surveys have been made and plotted to determine the natural contours, a plot plan showing location of all the buildings and other structures required for the ultimate institution as agreed upon with the department and institution officials affected, is made.

PLOT PLANNING

This plot planning of State institutions corresponds to what laymen are coming to understand as regional and city planning and zoning.

In addition to this work connected with new sites for newly established institutions, surveys have been made and plot plans worked out covering the ultimate development of all existing institutions.

This work is one of the most important done by the Division. As new structures are erected and changes made, the plot

plans are corrected accordingly, and so constitute a permanent and very easily accessible record of all structures and installations both above and under ground, including all roads and walks. Field surveying and office work are required to be practically continuous in connection with this plot planning.

As a basis to enable successive Legislatures to determine on provisions to be made out of current funds for continuing development to meet the needs resulting from growth of the State and obsolescence of old structures, a long-time building construction program is worked out by the Division in cooperation with



GEO. B. McDOUGALL

Warning Signs on State Highways Will be Revamped to Aid Motorists

REVAMPING of the entire sign-marking of State roads has been decided upon by the Division of Highways.

Coincident with changes in the speed laws of California, which went into effect August 14th, new markers for highway, residential and business districts were authorized by the Highway Department and erected by the California State Automobile Association and the Automobile Club of Southern California.

These signs are paid for by the State and erected and maintained by these two clubs.

In conformity with the plan to readjust road markings throughout the State, the maintenance department of the Division of Highways now proposes:

First: To make a study of the present signing on the Redwood Highway for the purpose of improving this service, particularly at curve locations.

Second: To place reflectorized standard signs at the more dangerous curves.

Third: To place unreflectorized signs at curves where the radii is less than 1500 feet.

Fourth: Reflectorized warning signs to be installed at important road intersections where a known hazard exists.

Fifth: Survey to be made in conjunction with the Auto Club of Southern California, of the Arrowhead and Old Trails Highway, with a view to establishing adequate markings on these roads.

Black figures on a white background have been used to designate the forty-five-mile-per-hour legal speed limit on highways. They are

30 inches by 24 inches in dimension and have been erected for the present only on main arterial routes over which the State has jurisdiction. While not reflectorized, they have been placed close enough to the lane of travel so that they might be picked up at night by auto lights and serve as a constant reminder that the Highway Patrol will strictly enforce the new law, as announced recently by Chief E. Raymond Cato.

Mandatory signs, made so by the recent new legislative act, have been set up at the entrance to residential and business districts to the right of the road looking toward the section into which the auto is driving. Those in residential zones are 24 inches by 30, white figures on a black background.

The first of these signs as the autoist enters a restricted district is reflectorized.

An innovation which should meet approval of the autoing public has been the posting at the end of a restricted zone of a sign informing the driver that he has now passed through the 25-mile limit area.

In the business district through which a State highway passes, a similar sign notifying the autoist he is in a 20-mile zone has been placed.

LICENSE LAWS HELP

Eight states, including California, with standard laws for licensing motor vehicle drivers, have had 29 per cent fewer traffic deaths since the passage of the laws than they would have had with increases such as have occurred in the nonlicense states, according to a report received by the California State Automobile Association.

**STATE
SPEED LIMIT
45
MILES**

Captain's Football Tackle Saves Life of Falling Worker

FOOTBALLERS, take heed! There's a mighty fine tackle wasting his spare time when he might be playing on the gridiron.

He's Captain W. L. ("Buck") McCarthy of the Fresno County Highway Patrol squad.

And he demonstrated his tackling ability two weeks ago by turning it into a life-saving stunt.

He tackled a heavy man in midair at the tag end of a 35-foot fall!

During the recent serious Alder Springs forest fire, the highway patrol turned out to assist in quelling the flames. Among those present was Buck.

Jack Muir, an easterner visiting California, was working at the top of a bluff trying to dislodge a burning log to prevent it spreading fire. While chopping, he fell, ax in hand.

As he hurtled toward the rocky ground, 35 feet below, hanging grimly to the ax, McCarthy charged into him.

As "Buck" struck the flying worker, the ax flew from Muir's hand and he hit the ground at a fast roll, the sharp weapon barely escaping him. McCarthy was struck by a rolling rock as he made his flying tackle. His ankle was badly injured.

But he saved Muir's life.

TOLL BRIDGE BOUGHT

As a result of negotiations begun by Governor Rolph only a few days after his inauguration, the Blythe-Ehrenburg Toll Bridge became a free structure July 24th.

Movement to buy the bridge from the private company operating it and collecting tolls was begun in January when the Governor, following conferences with Governor Hunt of Arizona, named a committee to handle details.

Upon recommendation of Colonel Walter E. Garrison, head of this committee, the California Highway Commission voted \$115,000 as this State's share of the purchase of the bridge and agreed to maintain California's half of the structure.

The bridge is the longest and largest over the Colorado with the exception of Lee's Ferry Bridge.

That's Fine—Officer (to couple in parked car) "Don't you see the sign: 'Fine for Parking?'"

Driver: "Yes, officer, I see it and heartily agree with it."

The average California motorist used 50 gallons more gasoline during 1929 than the average motorist throughout the United States. Each motorist in the country averaged 544 gallons of gas that year, while the California motorist used 634 gallons, or nearly 17 per cent more than the National average.

Highway Officials' Annual Meet Called Brilliant Success

CONGRATULATIONS to the Western Association of State Highway Officials.

The annual meeting of this organization was held in San Francisco, July 10-11, and was attended by more than 100 highway officials and engineers of the Pacific Coast and inter-mountain states. It was a most successful meeting of the association.

The meeting was marked by a freedom of discussion and a wide range of topics. Much good will came from it. A closer contact has been established between the 11 western states on road building subjects.

A meeting such as this is the most important gathering that can be held. These men spend hundreds of millions of dollars annually for roads. They prepare the highways upon which tens of millions of people ride. Surely no other gathering of western officials compares to this one in importance to the nation.

The officers of the association deserve to be highly commended both upon the large attendance and the real value of the program and discussions. *Pacific Street and Road Builder* predicts that henceforth, each annual meeting will assume even greater prominence and that the association will develop into one of tremendous service to the West. We also congratulate the California highway officials who were in charge of the arrangements and the entertaining of delegates.—*Pacific Street and Road Builder*.

SAN DIEGO FIGURES

Motor vehicle registration figures for San Diego County show that a total of 79,040 passenger automobiles, trucks and motorcycles were registered at the beginning of this year in that area. The number of passenger cars was 74,186.

TRIP INTO MEXICO

Motorists of California are to have an opportunity of driving over and inspecting the northernmost link of the International Pacific Highway in Mexico on Sunday, September 13. The trip is being sponsored by the Nogales, Arizona, Chamber of Commerce.

This excellent opportunity for motorists to inspect the northern section of the great international highway carries with it many privileges. The Mexican customs, immigration and public health officers will dispense with all restrictions on entering Mexico and all motorists making the trip will be presented with a windshield sticker which will serve as a passport for the occasion.

Days of the Padres; Mining Romance Linked to Present Day Road Work

Romance of the early days, of the zealous padres and the gold mining camps of California, is drawn upon in the accompanying article to trace the history of rights of way throughout the State. Read before the annual meeting of the Western Association of State Highway officials in San Francisco, the paper deals in language easily understood by the layman, with the battle of California to provide adequate highways for the people of the State.

By FRANK B. DURKEE, General Right of Way Agent

TYPICAL of the changed attitude toward all phases of highway construction, is the importance now conceded to the question of title to rights of way. We have now arrived at the time when there must be no question of the public's right to the full use and enjoyment of an adequate right of way—nothing less will suffice properly to provide for the multiplying demands of modern highway traffic.

Early history of public ways in the West is the story of pioneer trails blazed, in the Southwest, by zealous padres, who carried the banners of Spain and Mexico, and in the central and northern states by those courageous men and women, who, consciously or unconsciously, determined to possess this western country for the United States. Those early trails were located almost in their entirety across public lands. What construction there was in the years before the automobile, to a remarkable extent, located the locations sought out by the pioneers.

RULED THEMSELVES

In the days of the mining frenzy, highway improvement was left almost altogether to those individuals directly interested in keeping the roads open. The right of way, like the adjacent mining claim, was there for the taking. Thousands came to partake of the bounty of the Federal government; innumerable mining claims were located without any authority of law except that provided by the miners themselves.

More than two decades had passed after the discovery of gold in California before Congress moved to provide by law for entry upon the public domain for mining purposes.

A few years earlier, in 1866, the Congress passed an act providing:

"The right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted."

This act is now referred to as **Section 2477 of the Revised Statutes of the United States**. It has remained unchanged from the day of its passage until the present. Out of this simple statute, of just twenty words, flows all the rights the public land states and their political subdivisions have to highway right of way across the unreserved public lands of the Federal government within their borders.

BRINGS LITIGATION

The act provides no maximum or minimum widths; no procedure for giving notice to either the Federal government or the public generally that the grant of right of way has been accepted. It applies, it should be clearly understood, only to the unreserved lands of the United States.

It was inevitable, as the West grew, that this statute should be the subject of litigation. Between lines of opinions of the learned men of the Federal and State courts, may be gleaned something of the fascinating story of the onward march of our western commonwealths. There is the case in which it was applied to the streets of a famous mining town of Montana; it was used to uphold the right of sheepmen in Wyoming to passage for their flocks through a certain pass in the mountains. It has been discussed and passed upon by courts in Wisconsin, Nebraska, Washington, Oregon, California and other states.

LAW'S INADEQUACY

Its meaning has been thoroughly adjudicated. To the attorney, it is a grant "*in praesentia*"; that is, "*in the present*." In other words, it was effective as a grant imme-

(Continued on Page 24)

Colorful Ceremony Held to Dedicate Bridge on Redwood Empire Highway

THE newly completed Mark West Bridge was officially presented to the traveling public July 31st by Earl Lee Kelly, chairman of the California Highway Commission, who, in his dedicatory speech, eulogized the beauties of the Redwood Empire and lauded the work of the Redwood Empire Association in building up the tourist industry within this scenic tour area.

Other speakers included: H. G. Ridgway, vice president of the Redwood Empire Association; Senator Herbert Slater of Santa Rosa; Max Schutz, master of the Healdsburg Progressive Grange; George Schmeyer, master of the State Grange; Ed Enzenauer of Healdsburg, chairman of the Sonoma County Board of Supervisors; and Joseph Talbot of Bennet Valley, who first crossed a bridge at this point in 1860.

Paul Travis was chairman of the day.

WATER FOR CHRISTENING

Following the speaking program the bridge was officially christened by Miss Esther Travis of Healdsburg with a bottle of Sonoma County mineral water, which was broken on the railing.

The "breaking of the barrier" ceremony then followed, a ribbon barrier being held by Miss Maxine Lewis as "Miss Healdsburg" and Miss Katherine Aylward as "Miss Santa Rosa," while Miss Leona Simonson of Cloverdale as "Miss Grange" cut the barrier.

The dedicatory program and ceremony was initiated by the Progressive Grange of Healdsburg, with the cooperation of the Redwood Empire Association, also the Healdsburg and Santa Rosa Chambers of Commerce.

OFFICIALS PARTICIPATE

Those participating included: County supervisors; chambers of commerce officers, directors and members; senators and assemblymen, newspaper publishers, farm bureau and grange leaders, and others from Sonoma and neighboring Redwood Empire counties.

Representatives of the California Redwood Association were also in attendance. Speakers pointed out that redwood was chosen for the main structure of the bridge because

of its everlasting and permanent physical quality.

Some interesting historic features of this Mark West Bridge site were furnished by J. A. McMinn of Healdsburg, former chairman of the Sonoma County Board of Supervisors and Sonoma County's member of the Nine Counties Highway Committee of the Redwood Empire Association.

HARDY PIONEER

A hardy pioneer named Mark West settled on the banks of Mark West Creek near the new bridge in 1840. He there erected a large adobe structure in the year 1841, the lower floor of which was used for horses, the upper floor of which had a tier of living and guest rooms, together with a tremendously large dining room. The lower floor also served as a fort for protection against Indians and highwaymen, the walls being at least three feet thick, the main structure of the adobe being made of redwood.

Around this first unit a flourishing town was built. Here the main-line stage coaches arranged stopovers and other large hotels were constructed, in addition to many stores and other commercial enterprises. The community was a center of activity for all the surrounding territory. Colorful fiestas took place annually.

BIRTH OF RAILROAD

Then in the sixties two competitive railroad companies were organized and construction commenced of two parallel lines, each in competition with the other, through Mark West. Finally one bought out the other, which is now the Northwestern Pacific Railroad.

However, since the latter railroad course was through Fulton, Mark West moved to Fulton, leaving a ghost town behind him. Nothing remains at Mark West Bridge now to indicate that there ever was a community there, for it is surrounded by peaceful, quiet orchards and farm lands.

Immediately following the bridge dedication Chairman Kelly and Eric Cullenward, secretary of the Highway Commission, were conducted over the Russian River arterial

Sonoma Celebrities Turn Out in Force At Healdsburg Fete

routings by Redwood Empire Association officials, the following making up the party:

J. A. McMin, member of the Nine Counties Highways Committee of the Redwood Highway Association; Supervisor Ed Enzenauer, chairman of the Board of Supervisors of Sonoma County; Frank McNamara, chairman of the Highway Committee of the Santa Rosa Chamber of Commerce; E. L. Finley, director of Redwood Empire Association were among those making the tour.

BEAUTY AND THE—dignitaries. It's the new Mark West Bridge dedication ceremony in Sonoma County over which Esther Travis ruled as Queen. In the rush below are the following from left to right: G. Lansing Hurd, J. A. Tedford, Harry Ridgway peeking over Tedford's shoulder; Paul M. Travis, master of ceremonies; Wallace Ware, Earl Lee Kelly, representing the Governor; Miss Travis, Max Schultz, Maxine Lewis (Miss Healdsburg), Laura Simonson (Miss Sonoma Grange), Katheryn Aylward (Miss Santa Rosa), Harry Dunbar, city manager of Santa Rosa; George Sehlmeier, master of the State Grange, and Ed Enzenauer, chairman Sonoma County Board of Supervisors. Just a happy family.

QUEEN "CROWNS" BRIDGE WITH BOTTLE OF WATER



18 in Patrol Cited For Merit; Several Capture Burglars

EIGHTEEN members of the California Highway Patrol were cited for performance of service of an unusually meritorious character during the month of July.

Six of these citations were issued to officers for services in preventing and extinguishing grain and forest fires. They were:

District Inspector J. R. Franck of District No. 2, Redding; Captain T. B. Myers of Lake County, Captain L. Wilson of Calaveras County, Officer R. P. Cornelison of El Dorado County, Officer J. Masini of Fresno County and Officer R. G. Trimble of Trinity County.

TWO CAPTAINS NAMED

Two captains, A. A. Morrison of Stanislaus County and L. S. Drais of San Joaquin County, were commended for the capture of two men wanted for burglary.

J. C. Lane, traffic officer of Kern County, caught two men engaged in smuggling two Chinese into the United States. For this he received a citation.

District Inspector E. L. Bruck was commended for detaining a man who later was found to be wanted in another state for embezzlement.

TRAPPED IN CARS

Captain E. Breuss of Glenn County was commended for extinguishing a fire in an automobile after it had overturned and endangered the occupants. T. J. Donarin, officer of Humboldt County, received a like citation for extinguishing a fire in a car that threatened three persons pinned beneath the vehicle.

J. Masini, Fresno County, was commended for catching a man wanted for murder, and L. H. Koher, Tulare County, was commended for capturing a man wanted in Washington for passing worthless checks.

C. E. Boomhower, Contra Costa County, received a citation for assistance in the capture of a bank bandit.

NABS TWO BURGLARS

T. Norwood, Sutter County, captured two burglars in a store they were robbing.

George Bray, operator's examiner working in Pasadena, was commended for attention to detail that resulted in the arrest of two men wanted for burglary and theft of an automobile.

Arrests Show Gain But Fines are Less Says Patrol Report

ALTHOUGH actual increase in personnel was but 9 per cent, officers of the California Highway Patrol increased their activities and gross volume of work 25 per cent during the first six months of 1931 as compared with the same period of the previous year.

The increase, reflected largely in the number of arrests and stops made, is shown in the semiannual report of patrol activities.

The average number of men employed on the highways during the period, including captains and patrolmen, but exclusive of inspectors, bureau heads and clerks, was 372 as compared with 340 for the same period of the previous year.

This number of officers stopped and warned a total of 162,346 persons for all types of violations for the six months, a gain of 27 per cent over the same period of the previous year.

They arrested 43,211, which number was a gain of 23 per cent. In performing their duties they rode a total of 4,380,919 miles during the six-month period, or 24 per cent more than for the same period of 1930.

Although arrests and stops show a 25 per cent increase, there was an apparent tendency on the part of the courts to be lenient with the violators. This was shown by a sharp drop in the gross amount of fines collected. Total fines for the six-month period of 1931 amounted to \$147,960 as compared with \$161,473 for 1930.

LARGE EXPOSITION

The world's largest exposition of machinery and materials—14,000,000 pounds of it—will be held in Detroit January 9-15, 1932, with the twenty-ninth annual convention and road show of the American Road Builders' Association. This event will assemble 25,000 road and street officials, contractors and manufacturers and distributors.

The American Road Builders' Association, a nonprofit organization engaged in developing highways and effecting economies in road and street construction and upkeep, was organized in Detroit in 1902, and has grown to represent all highway activities.

Six officers received honorable mention for the capture of seven automobile thieves. They are G. D. Donnelly, J. L. Brey and C. D. Dempsey of San Luis Obispo County, E. M. Axtell and G. C. Malone of Siskiyou County and C. E. Boomhower of Contra Costa County.

Cato Named Chief: Bevans Temporarily Heads New Division

E. RAYMOND CATO has been appointed Chief of the Division of Enforcement of the newly set up Department of Motor Vehicles.

In other words, he is head of the California Highway Patrol.

Daniel O'Brien, Director of Penology, has been named Acting Director of the Department of Motor Vehicles by the Governor. He will occupy this position until such time as a permanent head be selected.

HAS TWO BRANCHES

The department, formerly the Division of Motor Vehicles under the Department of Public Works, is a new one created by the last Legislature. It consists of two branches, the Division of Registration under a chief known as the Registrar of Vehicles, and the Division of Law Enforcement, known as the California Highway Patrol.

Russell Bevans, Chief Inspector of the Highway Patrol, has been named Acting Registrar of Vehicles while retaining his inspector's rank. Bevans will take over the functions previously performed by Frank Snook, whose position automatically died at midnight August 13th, when the Division of Motor Vehicles went out of existence.

NAMES NEW MANAGER

Bevans has announced appointment of William McCarthy of the Recorder's office in San Francisco to the position of branch manager of the San Francisco registration office.

He further has announced that there will be no change now in the personnel of the headquarters office. That means M. A. Page will remain as Chief Clerk and B. A. Travis, Assistant Chief Clerk.

Roy Youngblood, whose title has been Assistant Superintendent of the Highway Patrol, has been named assistant chief under the new law.

He will continue to assist Chief Cato in administration of the Patrol.

Roadside trees planted by the Los Angeles County Forestry Department numbered 13,761 in 1930. The entire forestation program for the year within the county showed field planting of 56,861 trees.

Charlie Andrew: "Say Stover, give me a speedy and brief definition of a dry dock."

H. D. Stover: "A physician who won't give out prescriptions."



Chief E. Raymond Cato

Colonel John Skeggs Weds in Santa Rosa

Colonel John H. Skeggs, division engineer, with headquarters in San Francisco, has returned to the Bay City with a bride.

She was Miss Ellanette Fagrelus of San Francisco.

The couple were quietly married July 2d at the Church of the Incarnation, Santa Rosa, the Reverend Egbert B. Clark officiating.

They left immediately for Cleveland, Ohio, where the Colonel was a delegate from Islam Temple to the imperial conclave of the Mystic Shrine.

Colonel Skeggs is one of the best known highway engineers in the West. He won war-time renown for his work in building roads under fire in France. He is scheduled to become Illustrious Potentate of Islam Temple next year.

The bride is from San Francisco, where she had been engaged in real estate activities.

OFFICIAL TRAFFIC COUNT PUBLISHED AS ADDENDUM

As an addendum to the August publication of *California Highways and Public Works*, there is being circulated with the magazine a semiannual report of a traffic count taken by the Division of Highways July 12th and 13th.

A comparison of this count with that of a year ago shows a decrease for all routes of the State Highway system of 5.6 per cent on Sundays and 0.6 per cent on Mondays. On the other hand, the gasoline tax for comparable periods of 1930 and 1931 shows increased consumption approximating 6 per cent. This paradox may be explained by the gas war which prevailed during the spring months, but which ended before the census was taken.

The supplement to the *Highway Bulletin*, mailed with this issue, gives complete details of the count in each county and road district of California.

Santa Monica Company Gives Land for Road

The most recent instance of wholehearted cooperation by property owners with State highway officials in the matter of furnishing rights of way for State highway purposes is conveyance of the required easement for a portion of the Roosevelt Highway near Ocean Park, Los Angeles County, through the property of the Santa Monica Dairy Company owned by Mayor H. Michel of Santa Monica.

The property is improved as a high-class dairy. Mayor Michel, on behalf of his company, has now signed the necessary papers for the right of way with no allowance to his company for the value of the land taken or for severance damages.

Ally that he has requested from the State is simply the cost of moving and replacing the existing facilities at the lowest figure determined by competitive bids received for such moving operations.

Forty-five states will spend more than \$1,000,000,000 for public construction in 1931, the President's Emergency Committee for Employment have announced.

Stamped: A lady was driving along a country road when she spied a couple of repair men climbing a telephone pole.

"Fools," she exclaimed to her companion, "they must think I never drove a car before."

Lost are Reunited, Stolen Cars Found By Auto File System

(Continued from Page 2)

than 22,000 Smiths alone in the files, not to mention about 16,000 Joneses and several thousand Whites and Blacks.

The files offer a quick means of stopping sales of stolen cars. As soon as a car is reported stolen, a "stop card" is placed in the engine file and duplicate cards sent to all branch offices of the division. As soon as an application is made to transfer the car, the applicant is held until he is able to explain his part of the transaction to the satisfaction of the authorities.

Lost relatives are located frequently and families reunited by means of the records, for they yield information concerning the address of more than 2,000,000 people.

It is possible also to gain considerably more specific information from the operators' file, where the records of licenses issued for drivers are kept.

These give the age and general personal description of every person holding a license to drive in the State and often show the information sought when all other sources fail.

In addition to the telephone service, the Division answers thousands of letters and telegrams every month from persons desirous of registration information.

The demand of the taxpayers of the State is so great for the information afforded that the Department employs constantly a force of 110 girls at Sacramento, San Francisco and Los Angeles, who do nothing but keep them in shape.

WAR ON TRAFFIC DEATHS

Confronted with a steadily mounting toll of traffic deaths and injuries in the State, the California Committee on Public Safety is taking steps to enlist the joint efforts of authorities and the public in a vigorous endeavor to reduce the traffic accident toll. State officials, civic leaders and representatives of organized motorism will be represented at a meeting of the executive committee of the state-wide group called for September 11 in San Francisco.

The California Committee on Public Safety consists of representatives of more than forty civic organizations and State departments interested in traffic safety. Motorists are represented by the California State Automobile Association and the Automobile Club of Southern California.

The gravity of the problem was emphasized with the recent issuance of a statistical report by the State Department of Motor Vehicles. The figures disclosed that during the first six months of this year the total number of persons killed in traffic accidents was 1216. This was 150 more than the number of deaths in the first half of 1930 and represented an increase of 14 per cent.

Rim o' World Road Partly Completed; More Work Planned

Fourteen and one-half miles of the Rim o' the World Highway, providing access to the beautiful San Bernardino Mountain region which includes Lake Arrowhead and Big Bear Lake, have been completed, as shown in the accompanying pictures. They are typical scenes along this attractive route.

The work was completed at a cost to the State of approximately \$725,000 for the last three contracts, and the road dedicated last month with appropriate ceremonies.

There is provided in the current budget, funds for completion of this route. Surveys



have been completed and five and one-half more miles of highway will be constructed at a cost of \$650,000. E. Q. Sullivan, district engineer, with headquarters at San Bernardino, will supervise the work.

This road is the most heavily traveled recreational State highway in southern California. It is thronged with traffic every week end, and, over the July Fourth period, the Forest Service reports 65,000 persons traversed it.

If you are planning on an auto trip and are looking for some good place to stop, don't overlook the railroad crossings.

Oh Yea? He was standing alone on the corner. He shook his head and mumbled: "No, no, no—no, no, no." And as the crowd grew larger his "no, no, no," grew louder.

An officer shook his arm: "What's the matter?" "Nothing at all," he replied. "I'm just a 'yes' man taking a day off."

Distinguished Men on Water Committee

Continued from Page 1

"The California Water Resources Commission will study and report upon the engineering plan proposed by the State Department of Public Works and other proposals, particularly as to economic, legal, legislative and financial phases, to the end that a definite program be submitted for consideration by a future session of the Legislature. It is my hope that such a program can be evolved and that this commission and the joint legislative committee will be able to draft such necessary legislation which can be considered favorably at a special session of the Legislature for submission to the electorate at the general election in 1932. * * *

ALL ASKED TO HELP

"Concerted and earnest effort must be made by all to the end that California continue to progress and prosper. Therefore, I appeal to you individually and collectively for your help in working out a proper and basically sound solution to our most important and pressing problem of water which confronts our State. As your Governor, I will do my part."

Governor Rolph also appointed fifteen honorary advisory committees representing all interests and localities in the State to lend their sound business judgment and experience to assist in formulating a proper plan for the development of California's waters.

The Legislature has also appointed a legislative committee of fourteen members, seven members from the Assembly and seven members from the Senate, to study the economic, legal and constitutional questions relating to the water resources and proposed plan for conservation, development and distribution thereof and prepare and submit such proposed legislation, resolutions and constitutional amendments as may be necessary to carry into effect a coordinated plan.

HERE'S COMMITTEE

Senator B. S. Crittenden of Stockton, San Joaquin County, was elected chairman of this committee; Assemblyman Robert P. Easley of Antioch, Contra Costa County, as vice chairman, and Assemblyman Robert L. Patterson of Bakersfield, Kern County, as secretary. The other members of the committee are:

SERIES OF ARTICLES ON WATER PROBLEMS WILL BE PUBLISHED

Governor Rolph has publicly announced that he will call a special session of the Legislature to consider necessary legislation on California's water resources if and when the various interests and geographical divisions of the State reconcile their differences and are able to agree upon a practicable program of development which would be fair and just to all sections of the State.

Both the Governor's Commission and the Legislative Committee are actively engaged in the study of the problem. Many local committees have been formed to present the local problems in relation to the State-wide plan to the commission and committee.

Due to the widespread and increasing interest that has developed in the water problem, it is thought that a presentation of the various phases of the problem will assist in its successful solution.

To this end this magazine will outline the individual problems and views of the different localities in a series of articles. They will cover the Sacramento Valley and Sacramento-San Joaquin Delta, Southern California, San Joaquin Valley, the financial aspects of the problem and the relationship and interest of the Federal Government.

Senator C. C. Baker, Salinas, Monterey County.

Senator Ralph H. Clock, Long Beach, Los Angeles County.

Senator Frank W. Mixter, Exeter, Tulare County.

Senator W. P. Rich, Marysville, Yuba County.

Senator Andrew R. Schottky, Merced, Merced County.

Senator Ralph E. Swing, San Bernardino, San Bernardino County.

Assemblyman Edward Craig, Brea, Orange County.

Assemblyman Harold C. Cloudman, Berkeley, Alameda County.

Assemblyman John E. Frazier, Gridley, Butte County.

Assemblyman Frank S. Israel, Linden, San Joaquin County.

Assemblyman Chester M. Kline, San Jacinto, Riverside County.

Water Held Vital Need

TOO MUCH stress could not be placed upon the vital need of southern California for a greater water supply. Growth has advanced close to the point where no further development is possible until the supply has been procured and the machinery for its distribution is functioning.

When the Owens River aqueduct was constructed many scoffed at it as a useless expenditure. Had the croakers of that day been heeded this area could not have gained in population and wealth, nor could Los Angeles have become the metropolis that it is.


Occasion for increasing the water supply is even more evident than it had been when the faith of far-seeing men brought the aqueduct into existence. Even these men deemed that in providing water for a city of 1,000,000 they were doing enough for a long time, perhaps enough for an indefinite period. Pronounced as was their optimism concerning expansion, the situation today shows that they made an underestimate of the future's imperative demands.

Southern California must have this water. The question is one of industrial life or death.—*Long Beach Sun*.

HARD AT WORK

The legislative committee has held meetings in Los Angeles, Salinas and from August 5th to 14th held public hearings in San Francisco for the various interests and localities in the State and are hard at work in their study of the problem.

The long period of subnormal rainfall and the unparalleled growth and development of the State have increased the water shortage until it is recognized by both public and private agencies as being acute.

 The problem is neither local in character nor confined to any one type of use. From Siskiyou to San Diego, not only from agricultural users, but from industrial, municipal and other consumers, demands for a solution of and relief from water shortage have multiplied year by year. In numerous cases due to continued use in excess of replenishment, supplies formerly dependable, have become seriously reduced. Population and water consumption have so increased that cheap and easily obtainable water supplies are now practically exhausted. It is, therefore, manifestly beyond the ability of community enterprises to overcome physical obstacles in securing additional water. The water which may yet be placed under control and conserved constitute the one natural resource limiting the future growth of population and wealth in California.

AGENCIES ACTIVE

Throughout the State, various agencies are actively giving the water problem their study and attention and are formulating the needs and views of the different localities. Widespread interest is shown and the people of California will successfully solve this urgent problem, as they have similarly solved great questions in the past.

The Governor's message and the names of the Governor's water commission, the legislative committee and of the honorary advisory committees have been published in a pamphlet by the Governor's office for distribution to the people of California. The pamphlet also gives a concise resume of the State water plan as recommended by the Department of Public Works with a map showing the distribution of the water resources of the State and a map showing the proposed plan.

WATCH THAT SPARK

Remember to put out cigars, cigarettes and pipe heels while on your vacation. Also the lighted match carelessly thrown on the ground. The Forest Service notes that 8,372,000 acres have been destroyed by fire in the last ten years, causing damage estimated at \$14,424,000. This is a heavy price to pay for wanton carelessness.

Nurse: "Have you ever run a temperature?"
Worse: "No, but I've driven most every other kind of car."

Orchards, Field Crops, Rice Saved By Cooperation in Lower River

By HARLOWE M. STAFFORD, Sacramento-San Joaquin Water Supervisor

ON JULY 10, 1931, the Feather River went dry at Nicolaus, about ten miles above the mouth, with a number of large irrigation pumping diversions below Marysville depending on its flow. Something had to be done to save the large area of orchards, field crops and rice which the river had been supplying.

The conditions were investigated by the Water Supervisor's office and after a number of preliminary conferences between the various water users and the State Engineer's

Canal Company, were to pass down the river by the latter company's diversion dam a short distance below Oroville, there would be needed not only voluntary cuts on the part of the two large canals, Western and Sutter-Butte, but additional storage release by the Pacific Gas and Electric Company, owner of Almanor and Bucks Lakes in the North Fork drainage of the Feather.

It was shown that the releases from Almanor were already such as to keep the Caribon power plant running continuously at full capacity. However, as a result of the Oroville meeting the power company agreed to help further and an additional release was made from Bucks Lake. This, together with the temporary cuts of Western and Sutter-Butte canals furnished a flow which sent the water to a point below Nicolaus Bridge, supplying all pumps except those of Sutter Basin Company two and one-half miles above the river's mouth.

At both the Sacramento and Oroville meetings the need was stressed for a State Water Master to insure the proper distribution of the available flow in the river and to effect such savings as might be possible through a schedule of rotation or other regulation of this nature. In fact, the additional release of storage by the power company was made contingent upon the placing of control of diversions in the hands of a State Water Master.

An agreement providing for a Water Master for the 1931 season was drawn up and presented to the water users at the Sacramento meeting with the State Engineer and the signatures were practically completed at the Oroville meeting. Fred E. Anderson, who had been covering the regular Feather River diversion measurements in connection with the work of the Sacramento-San Joaquin Water Supervisor's office, acted as Water Master beginning July 23 until shortly thereafter Wm. Allan Laffin was made Water Master, devoting his entire time to this work. A schedule of rotation among general crop water users was placed in effect and the water was conserved to the greatest possible extent.

Subsequently it was found that additional storage releases would be necessary to reach



DRY AS SAHARA—That was the condition of the Feather River at Nicolaus recently until cooperation and appointment of a water master relieved the situation. This is a view of the river showing the bridge at Nicolaus.

office, two meetings conducted by Edward Hyatt, State Engineer, one at Sacramento on July 21 and the other at Oroville on July 22, resulted in relief action.

These meetings were attended by the larger water users on the lower river, by representatives of the Sutter-Butte Canal Company, the Western Canal Company, the Pacific Gas and Electric Company, and, at the Oroville meeting, by a representative of the State Railroad Commission.

It was apparent from the facts presented that if sufficient water in addition to the natural flow, claimed by the Sutter-Butte

Rigid Conservation Helps to Save Crops Along Feather River

the pumps of the Sutter-Basin Company below Nicolaus, and through representations of this company to the Pacific Gas and Electric Company and particularly in view of the fact that a strict control of all releases would be exercised by the Water Master, the power company by-passed a large additional flow



HIGH AND DRY—Another view of the Feather River at Nicolaus. The old boat is afloat on sand, being left stranded when the river ceased to flow at this point. Release of water by power companies and rigid conservation remedied the condition.

(in excess of the capacity of Caribou power plant) from Lake Almanor, beginning July 30, 1931. This flow reached the Sutter Basin pumps.

Up to the present time, through close regulation by the Water Master and a fine cooperation on the part of all water users, the Sutter-Butte Canal Company, Western Canal Company and Pacific Gas and Electric Company, the crops and fields which would otherwise have dried up have been successfully supplied. It appears probable that the present season's Feather River situation may lead to an action for ultimate adjudication of the water rights on the river below Oroville.

WHY IS IT?

Why is it that persons who scorn to cheat at cards think nothing of cheating in traffic?

This is one of the posers asked by the National Safety Council, which finds that we have one code of ethics for driving and another for the home.

Northern Gateways To State Show Big Influx of Machines

AUTOMOBILE traffic into California through the northern gateways has been greater during the past fourteen months than the volume of travel through the southern border stations. This is revealed in an analysis by the Highways Bureau of the California State Automobile Association of official figures for the period received from the State Department of Agriculture. The department checks all incoming cars at the border.

The period covered by the study is from May 1, 1930, to July 1, 1931. The total number of vehicles which passed through all the quarantine stations was 895,001. Of this number, 522,738, or 59 per cent, were cars registered in California.

IMPOSING AVERAGES

Those with California license plates checked through at the northern stations totaled 378,588, or 72 per cent of the resident cars, leaving 144,150, or 28 per cent, for the southern gateways.

This gives an average of 37,335 vehicles with a California license entering each month, an average of 27,042 for the north and 10,296 for the south.

Cars carrying the license plates of other states which entered during the same period were 372,263, or 41 per cent of the total.

MANY "FOREIGN" CARS

Of these "foreign" cars, 208,687, or 56 per cent, entered through northern stations, and 163,576, or 44 per cent, came in through southern border points.

An average of 26,590 "foreign" cars entered the State each month. With an average number of 2.6 persons per vehicle, these cars brought an average of 69,134 people into the State every month. The monthly average of such cars entering in the north was 14,906, and in the south 11,684.

Two truck drivers were all snarled up in the traffic at the intersection at West Broadway and Chambers Street, New York City. One of the drivers lost his temper and yelled at the other one: "Why don't you look where you're going, you great, big, cross-eyed, bow-legged, knock-kneed, son of a blankity blank, blank! blank! blank!! * * * pie-eyed dumb-bell!!!"

The other driver smiling sweetly said, "You're nice looking, too, buddy."—*National Motorist*.

Roads Taken Into Highway System

Continued from Page 4

struct highways by the most direct and practical routes between the termini stated herein, which highways are declared to be, and classified as, secondary State highways. They are:

(a) Alturas to Oregon State line, near New Pine Creek.

(b) Quincy to State Highway Route 29, near Chats.

(c) Vallejo to State Highway Route 8.

(d) Walnut Creek to Oakland.

(e) Weed to California-Oregon State line, near Calor.

(f) Bishop to California-Nevada State Line (Montgomery Pass).

(g) Bakersfield to Mojave.

(h) Red Box Divide to Pine Flats (Route 61 to Route 62).

(i) State Highway Route 26, near Colton via Pomona to Los Angeles.

(j) State Highway Route 43, Waterman

Canyon via Santa Ana Canyon to Newport Beach.

(k) Beaumont to Riverside (Jackrabbit Trail).

(l) Riverside to San Diego (Inland Route).

(m) Pomona to Temecula.

(n) Blythe to California-Arizona State line at the Colorado River and State Highway Route 64 to State Highway Route 26, near Indio.

(o) National City to international boundary line, near Tia Juana.

(p) El Centro to Calexico.

(q) Oasis to California-Nevada State line.

(r) State Highway Route 2 near Ventura to State Highway Route 4 at Castaic Junction.

(s) From State Highway Route 31 near Cajon Pass to State Highway Route 23 near Lancaster.



CURVES IN STYLE? Well, They're not very popular with this gang. They are slope men beginning preliminary operations for the removal of curves on the Redwood highway south of Eureka near Pepperwood. Long range visibility prevents accidents.

County Supervisors Sent Resolution

Continued from Preceding Page



OIL RIGHT—this photo. The boys are moving in with machinery to start oiling sixty miles of road to the big hills on the Redding-Alturas Lateral. Modern equipment assures good results on this job.

- (t) Pomona to Fullerton via Brea Canyon.
- (u) Cambria to San Luis Obispo.
- (v) Santa Barbara to State Highway Route 2 at Zaca via San Marcos Pass.
- (w) State Highway Route 14 near Crockett to American Canyon route near Vallejo.

ADOPT SAFEGUARD

The provision in the bill that these secondary highways be laid out and constructed by the *most direct and practical routes* between the designated termini, will necessitate, as has been stated above, the future abandonment of certain portions of the routes selected. To guard against any misunderstanding on this score, the supervisors of the counties affected were requested by the Highway Commission to approve the following resolution, which embodied the description of the road taken over:

WHEREAS, Chapter 82 of the California State Statutes of 1931 declares the most practical and direct route between certain designated termini as secondary State highways, the California Highway Commission, under authority of section 365d of the Political Code of the State of California, will on August 14, 1931, extend State maintenance to the most practical and direct traversable county road between the designated termini. The following county road will be maintained:

Description of route then follows.

Therefore, Be it Resolved, That the County of _____, acting by and through its Board of Supervisors, does hereby consent to the California Highway Commission taking control of and maintaining the above described county road and does further agree that the State of California, acting by and through said California Highway Commission, may relinquish to this county, and this county will resume full control and responsibility for such portions of the aforesaid county road as shall not be included within the layout of said State Highway as finally laid out, adopted and constructed.

DO NOT QUALIFY

While the total mileage of these secondary roads, when laid out and constructed, will total 804 miles, the mileage actually taken over for maintenance is but 722.75 miles. This is due to the fact that certain portions of the routes considered did not qualify within the meaning of the act in being the most direct route, while on several routes no traversable route existed.

In these cases, the amount which would have been spent for maintenance, providing the routing was available, will now augment the maintenance funds set aside for the remaining new secondary roads in that particular county.

Keeping Pace With Road Improvements

A resume of work being done in many counties is given herein by two district engineers of the Division of Highways. The nature of the projects and the progress being made is reported.

From L. H. GIBSON, District V

SAN BENITO COUNTY: Plans are complete for a change of line from a point near the San Benito River north of San Juan Bautista to the Monterey County line. This is part of the change of line via Prunedale, a portion of which is now under construction in Monterey County to eliminate the San Juan Grade. On the lateral highway from three miles north of Hollister to the Pacheco Pass road progress is being made on resurfacing the road with asphaltic macadam. The Granite Construction Company is the contractor. On the Coast Highway throughout the district and on the Hollister lateral center line traffic stripe is being painted. McEverlast Company, Incorporated, is the contractor.

MONTEREY COUNTY: Progress is being made on the bridge across the Salinas River at Bradley. H. E. Dorring is the contractor under the supervision of the Bridge Department.

On the Coast Highway from two and one-half miles north of Salinas to the Monterey-San Benito County line, a new road is being constructed through Prunedale. The roadbed is 36 feet wide and it will be paved with 20-foot Portland cement concrete. This project, with a portion of road to be constructed in San Benito County, will eliminate the old San Juan Grade from the main Coast Highway. The Peninsula Paving Company is the contractor.

The earth shoulders on the Coast Highway between Salinas and Chualar have been treated with fuel oil by the road mix method. C. W. Wood was the contractor. On the Coast Highway between San Lucas and three and one-half miles north, the earth shoulders have been treated with fuel oil by the road mix method. The contractor was the Granite Construction Company.

On the Roosevelt Highway a reinforced concrete arch bridge across Garapata Creek, including a change of line three-tenths of a mile in length, is under construction. The Hanrahan Company is the contractor.

On the Roosevelt Highway a reinforced concrete arch bridge across Granite Creek, about 14 miles south of Monterey, is under construction. Geo. J. Ulrich Construction Company is the contractor.

SAN LUIS OBISPO COUNTY: On the Coast Highway between Paso Robles and two-tenths of a mile north of the San Luis Obispo-Monterey County line, the road has been reconstructed with a 36-foot roadbed and a 20-foot asphaltic cement pavement. The contractor was the Peninsula Paving Company. Within the limits of this project a new reinforced concrete bridge is being constructed across San Marcos Creek. L. C. Clark and C. E. Doughty are the contractors.

Between Atascadero and one and one-half miles south of Santa Margarita, the road is being reconstructed with a 36-foot roadbed and a 20-foot second-

From E. E. WALLACE, District VI

KERN COUNTY: Work on widening the grade and placing cutback asphalt borders between Bakersfield and Grapevine Station on Route No. 99 is proceeding rapidly.

The portion of this job, which is 17 miles on tangent crossing the desert south of Bakersfield, lies on a very deceptive grade. It is found that many motorists travel at an excessive speed, very often not realizing that there is a continuous down grade toward Bakersfield, and many accidents have happened during the past years. By continuous vigilance and controlling the construction operations, it is believed that the accidents have been held to a lower minimum than ordinarily, had there been no contract in progress. Numerous flagmen are employed to warn and direct traffic, which has resulted in adequate protection for the traveling public. In a few instances, accidents have happened due entirely to excessive speed and disregard of warning signals.

Oiling contract on Route No. 57 from west boundary of Kern County to towards Maricopa, nine and one-half miles being done by the Pacific Tank Lines, Inc., has been completed and the outfit has moved to Fresno County, west of Parkfield Junction, for the completion of that portion of their contract.

A contract has also been awarded to Oilfields Trucking Company, Ltd., of Taft, for dust oiling approximately 30 miles from Democrat Springs to Weldon, on Route No. 57 in Kern County.

TULARE COUNTY: Union Paving Company is now making good progress on widening and resurfacing of highway on Route No. 99 between Goshen and Kingsburg. The paving plant is not yet started, but will do so about the first week of August. Many thousands of yards of earth are being hauled in from adjacent borrow pits to widen the roadbed to 36 feet and provide safe slopes for traffic. This improvement will result in considerable added safety to traffic, as about one-half of the 12 miles lies through alkali soil which is very treacherous during wet weather.

On the same contract five concrete bridges are being replaced or widened by Contractor Metzger. This work is well under way at the present time.

On July 8, advertisement was made for bids covering proposed improvement between Tipton Crossing and Tulare on Route No. 99 in Tulare County. This improvement will lie on a new location east of the Southern Pacific Railroad. The improvement will consist of a 36-foot roadbed, with 20-foot Portland cement concrete pavement. Bids are also requested for five bridges varying from 20 to 300 feet in length. This will be handled as a separate contract, but simultaneously with the road work.

This improvement, when completed, will eliminate two grade crossings of the Southern Pacific Company's main line, one at the south city limits of Tulare and

BOTTLENECKS broken. Recent widening of the heavily traveled boulevard on the Coast Highway north of Santa Monica has brought joy to motorists and relieved a serious traffic problem. The Topanga and Las Flores Creek bridges in Los Angeles County have been widened at a cost of \$26,200. Here's a view of the new road over the Topanga Creek and below the Las Flores Creek road.



New Right of Way Laws Are Urged

Continued from Page 9

diately upon its passage by the Congress and approval by the President. This grant, however, the courts point out, necessarily remains in abeyance until it is accepted by the public. Such acceptance must be by some definite act upon the part of a state or other public authority by which it takes possession of a definite parcel of right of way. As the law now stands, what constitutes acceptance is a fact to be determined in each particular case.

The inadequacy of the act as a solution of present day right of way problems on the public domain is evident when it is realized there is no agency of the Federal government that will undertake to say how much right of way may be taken under it; no department where maps may be filed; no effective way of giving notice to the public that rights have been acquired short of the actual, physical taking possession of the right of way.

It is unnecessary to urge before this body the obvious reasons why such indefinite title to rights of way does not suffice for modern highway needs—why some way must be provided to take advantage of the Federal grant between the time a new highway is projected and its ultimate construction.

MAPS ARE REFUSED

The Division of Highways of California has, on several occasions, sought to file with the United States land offices maps showing definite locations and widths of right of way across the public lands. The Land Office has refused to accept such maps for filing. A similar request, made through the Bureau of Public Roads, was definitely refused in recent months. It is the position of the Land Office that the act in question does not authorize acceptance for filing of right of way maps.

It has been pointed out that section 17 of the Federal Highway Act authorizes the submission of such maps to the Department of the Interior (which has jurisdiction over unreserved Federal lands) through the Department of Agriculture. Such procedure seems to be within the purview of this section, and, in California, we plan to take such action, if no better way can be found to protect the rights of the State.

ABUSES CITED

Section 17, however, in our opinion, is as inadequate as section 2477 of the Revised Statutes because of the length of time required to have a right of way reserved by this procedure, which is often several months. While the application is pending before the Federal departments, it is possible, and it frequently happens, that numerous mining claims are located along the line of the survey or even overlapping it. The easily accomplished staking out of a claim and filing for record of the required notice in the office of the county recorder places such mining locators in possession of that which the Federal government intended the public should have free places such locators in a position to demand tribute for that which cost them nothing, which, frequently, they have no intention of exploiting as a mine but seek to use only for private profit as sites for gaudily painted roadside-eating stands, gasoline stations, camp grounds, or other surface uses.

Under such circumstances, urgently needed highway improvements can not await determination of such questions as actual discovery of mineral deposits, valid filings, or priority of right—it is a question of the uncertainty of condemnation proceedings or paying, and, with the engineering department demanding clearance for the right of way, the right of way agent often is forced to make the best bargain he can.

MINING LOCATOR

To appreciate properly the situation, it is necessary to understand clearly the nature of the title of the locator of a mining claim. Such a locator, prior to patent, does not own the fee which, of course, remains in the United States. He has a possessory right, however, which, in California and other western states, is regarded as real property and is recognized as a legal estate of freehold. As against everyone except the United States, the locator is regarded as the actual owner. This doctrine has been upheld by the Supreme Court of the United States in a case as recent as January, 1930. This possessory right, if supported by a valid filing, dates from the time of the alleged discovery of mineral and extends to the exclusive possession and enjoyment of the entire surface included within the lines of the location, whether or not necessary for mining operations.

It is not necessary that the locator ever proceed to secure a patent from the United States; the law does not require that he do so—in fact, a patent adds little to his title. If he abandons the claim, he may return at any time to resume possession unless the claim has been relocated by another in his absence. Unless he applies for a patent, there may never be an examination to determine if mineral deposits actually exist within the claim or if a valid discovery has, in fact, been made. There is no limit to the number of claims one individual or a single corporation may locate or acquire. Land titles in California are clouded with innumerable filings of this nature.

TASK ALMOST HOPELESS

It is only when such filings are made within the national forests that an active effort is made by representatives of the Federal government to determine their legitimacy. The Forest Service, in California, has been campaigning against such locations for years, but the ease with which mining locations may be made brings a new crop with every new highway into the forest areas and, under existing laws, the task is almost hopeless.

Section 17 of the Highway Act provides also for the reservation of sites for quarries and other materials needed for the construction of highways on Federal aid and forest highway systems. But even when maps are filed and the reservation made by the department having jurisdiction over the lands in question, there is no assurance that a subsequent mining location may not be made, by a filing with the county recorder, and possession taken of the tracks desired by the State. This is equally true regarding reservations of rights of way under this section. To dispossess a locator under such circumstances may require court action and a costly delay in the highway construction program. Such a result is possible because, inconsistently, the reservation under the Highway Act is a

Proposes Changes in Mining Laws

Continued from Preceding Page

Federal record and the mining location is a State record, although both filings relate to Federal lands.

By the Leasing Act of 1920, the Congress effected a complete change of policy in respect of the disposition of lands containing deposits of coal, phosphate, sodium, oil, oil shale, and gas. Such lands are no longer open to location and acquisition of title, but only to lease. Mining in the national forests of the East is conducted under the lease system. Consistently and logically, this policy might be extended and made applicable to all forms of mining in the forests of the West. Such legislation would be, no doubt, an ideal means for overcoming the existing situation as regards highway rights of way across mining claims. Under such a system of leases or permits, the matter of rights of way could be made the subject of departmental regulation.

But we, in California, advocate no such radical remedy. We ask for nothing that will interfere with or impose a burden on any legitimate mining project undertaken in good faith. We demand relief only against those who, taking advantage of laws enacted to meet an entirely different situation in the time of our grandfathers, seek private gain by perpetrating a fraud against the government.

REVISION PROPOSED

To meet the situation herein briefly outlined, the following is suggested as desirable Federal legislation:

1. Amendment of the laws regulating the National forests to provide that the forests shall not be open to location for mining purposes; that mining within such areas shall be carried on only in accordance with rules and regulations to be promulgated by the Secretary of Agriculture. Such action will make it possible for the Forest Service to make fully effective permits granted by it for highway purposes.
2. Amendment of the Federal mining laws to provide:

- (a) That no location for mining purposes shall be valid for any purpose until notice of location is filed in the United States Land Office for the district within which the claim is located;
- (b) That no mining claim shall be located immediately adjacent to any public highway so as to interfere with the use thereof by the public or so as to be destructive of roadside values and beauties;
- (c) That every mining location shall be made subject to the right of the United States, any state, or political subdivision of a state, subsequently to enter thereon for the purpose of constructing public highways or removing therefrom road building materials, without compensation to the locator of the claim except for actual surface improvements in place within the projected right of way lines at the time the highway was laid out and established.

3. Revision of section 2477 of the Revised Statutes of the United States to provide:

- (a) For filing of maps in the respective land offices showing definite right of way locations and widths, such filing to constitute a reservation of such rights of way as against any subsequent patent, transfer or easement;
- (b) For filing of maps in the respective land offices for the reservation of sites for borrow pits and quarries or for the removal of other road-building materials for all public highways.

Such legislation is needed to remove the incentive for the filing of mining locations for other than legitimate mining purposes. Its enactment will bring the mining laws abreast of present-day conditions. It is necessary in the public interest.

Road Men Give Help In Putting Out Fire

The following letter, addressed to T. H. Dennis, maintenance engineer for the Division of Highways, needs no introduction. It speaks for itself:

Dear Mr. Dennis:

I was informed by State Forest Supervisor Nelander of Ukiah that on July 29th Road Foreman Jack Milford and three of his crew rendered valuable service on a fire about three miles south of Hopland, and that their efforts undoubtedly did much to save the valuable home of Mr. C. T. Smith, as well as to hold down what otherwise would have been a serious range fire.

I wish you would convey my thanks to Mr. Milford and his men for the valuable services which they rendered.

M. B. PRATT, State Forester.

C. R. Montgomery Named To Right of Way Post

C. R. Montgomery, Los Angeles attorney, and until recently connected with one of the large law offices of that city, has been appointed to the position of general right of way agent.

Mr. Montgomery graduated from Stanford University with the class of 1928 and was given the degree of J.D. by that university in 1930.

He was a high honor student at the university, having been elected to the legal honor society, the Order of the Coif. He also was named a member of Phi Beta Kappa and is a member of the Phi Delta Phi legal fraternity and of Beta Theta Pi.

Architectural Efficiency Explained

Continued from Page 6

each department and institution affected, and modified as necessary from time to time. The plot plans described above are an essential part of the foundation on which this long-time program is based and are indispensable for its preparation. This is one of the most important uses of the plot plans.

The ultimate plot plan of a particular institution takes into account, among other things, its site; its ultimate capacity; the speed of its development toward ultimate capacity as determined by the State's needs; the amounts of money that can reasonably be expected to be made available for expenditure on its development during succeeding bienniums.

The ultimate plot plan being available, the Division of Architecture in each of about thirty cases determines the particular structures which need to be provided during the ensuing biennium.

SKETCHES DEVELOPED

The State Architect or the Assistant Architect confers with the other State officers concerned, and, following the understanding reached at this first conference, a civil engineer makes and plots a survey of the site and preliminary sketches are developed.

In the making of the preliminary sketches the architectural designer has access for purposes of reference, to the principal architectural magazines for which the Division subscribes, to the Division's own library and to the very considerable collection of architectural works in the California State Library; he also has, as needed, the cooperation of the structural engineer, the mechanical and electrical engineer, the specification writer and the cost estimator who head their respective sections in the Division's organization. The elements of the project which are in the hands of these section heads are taken into account and scientifically incorporated in the architectural sketches as they are developed.

When the preliminary sketches and cost estimate are approved, copies of the sketches are placed in the hands of the chief architectural draftsman, who assigns various portions of the work of preparing the working drawings at small and larger scales among his staff of draftsmen. In addition to the supervision of the chief draftsman, the men pre-

paring the working drawings have particular supervision from the architectural designer and the Assistant Architect and the general supervision of the State Architect. Coordinating supervision is also available continuously as needed during the making of the working drawings from the structural engineer, the mechanical and electrical engineer, the specification writer and the cost estimator.

The administrative assistant to the State Architect, in addition to caring for the detailed business and financial administration of the Division's activities and coordinating its work with other State officers, departments and various institutions, also coordinates the entire technical program in the headquarters office so that the average of between 200 and 250 separate projects handled by the Division during each two-year period, distributed over the entire area of the State, costing between \$7,500,000 and \$8,000,000, are carried forward in an orderly, continuous and efficient fashion.

ACTUAL CONSTRUCTION

Construction work is handled either by contract or days labor. Coordination between the office and construction work in the field is maintained through the general superintendent of construction, who has immediate charge of all field work which is carried on under the continuous supervision of superintendents of building construction operating in the various parts of the State. A number of these superintendents have charge of the Division's work at two or three different institutions and have working under them an associate connected with each institution or single important project.

Governor Rolph's policy of speeding up construction work provided for by the 1931 Legislature for the purpose of relieving distress resulting from unemployment, securing the early completion of greatly needed buildings and obtaining for the State the financial benefits involved in present low construction costs, is serving also a further purpose. It is clearing the way to permit the Division of Architecture in addition to its regular work to start a year sooner than ever before to gather data needed and to do the necessary architectural and engineering work in connection with the projects in the ten-year build-

\$40,000,000 Total Building Program For 10 Year Period

ing construction program to be presented to the 1933 Legislature for consideration.

TEN-YEAR PROGRAM

This will make available for the first time in the history of the Division sufficient time for full and careful advance study of all projects, and for the completion of architectural and engineering office work by a time to permit of letting construction contracts as soon as the necessary funds are released.

It is expected that the building needs of the State during the ten years beginning July 1, 1933, will involve the expenditure of \$40,000,000. The organization of the Division of Architecture as herein indicated is such as to adequately care for this large program, taking fully into account all the great variety of services involved and giving full recognition to the highest ideals of both the art and science of the professions of architecture and engineering.

ARCHITECTURAL AWARDS For Month of July

List of projects handled by the Division of Architecture for which contracts were awarded by Colonel Walter E. Garrison, Director of Public Works, during the month of July, 1931.

July 2, 1931—Paris Brothers—Rough excavating and grading site for Hospital Building, Veterans' Home	\$10,885 00
July 8, 1931—Guth & Fox—Armory, National Guard of California, Yuba City	18,946 00
July 13, 1931—James L. Edmiston—Water well, California Institution for Women	4,798 00
Total	\$34,629 00

Horse Laugh: The true value of horse sense is clearly shown by the fact that the horse was afraid of the automobile during the period in which the pedestrian laughed at it.

Motor vehicle registration in San Francisco at the end of the first six months of this year had reached a total of 149,020. The number of passenger automobiles was 128,027, with the remainder consisting of other types of vehicles.

Only a few states have decreased their road appropriations for 1931 and the majority of them have made increased appropriations for this year, it is indicated in reports reaching the California State Automobile Association. In round numbers, a billion dollars will be spent on road construction and maintenance by State highway departments. California will maintain its budgeted expenditures of approximately \$100,000 a day in maintenance, new construction, and improving its road system.

Attention Engineers!

(From Oban, a seaport and tourist resort in Argyllshire, Scotland, this verse comes to us, through Mr. Gavin Gemmell, a director of the International Bitumen Emulsions Corporation, resident of London, who clipped it from the *Oban Times* and mailed it to the *BULLETIN*. While an interesting word-picture, it is incomplete to us on the Pacific coast, where in recent years one of the commonest phases of highway development has to do with the straightening of crooks and bends.—Editor.)—*Standard Oil Bulletin*, July, 1931.

THE GENESIS OF A ROAD

One day through the primeval wood
A calf walked home, as good calves should,
But made a trail, all bent askew,
A crooked trail, as all calves do.
Since then two hundred years have fled,
And I infer the calf is dead;
But still he left behind his trail;
And thereby hangs my moral tale.

The trail was taken up next day
By a lone dog that passed that way;
And then a wise bellwether sheep
Pursued the trail o'er vale and steep,
And drew the flock behind him, too,
As good bellwethers always do;
And from that day, o'er hill and glade,
Through those old woods a path was made.
And many men wound in and out,
And dodged and turned and bent about,
And uttered words of righteous wrath,
Because 'twas such a crooked path.
But still they follow (do not laugh)
The first migrations of that calf.

This forest path became a lane,
And bent and turned and turned again;
This crooked lane became a road,
Where many a poor horse, with his load,
Toiled on beneath the burning sun
And traveled some three miles in one—
And thus a century and a half
They trod the footsteps of that calf.

The years passed on in swift fleet;
The road became a village street,
And this (before men were aware)
A city's crowded thoroughfare;
And soon the central street was this
Of a renowned metropolis,
And men, two centuries and a half,
Trod in the footsteps of that calf.
Each day a hundred thousand rout,
Followed the zigzag calf about,
And o'er his crooked journey went,
The traffic of a continent,
A hundred thousand men were led
By one calf, near three centuries dead.

—Anonymous.

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the Month of July, 1931.

ORANGE COUNTY—Taffree Dam No. 791-2. Anaheim Union Water Company, Anaheim, Calif., owner; earth dam, 8 feet above streambed with a storage capacity of 50 acre-feet, for storage purposes, for irrigation use.

SHASTA COUNTY—False Lake Dam No. 223. O. Merlo, Redding, owner; earth dam, 13 feet above streambed, situated on North Fork Jenny Creek tributary to Sacramento River in Sec. 4, T. 31 N., R. 5 W., M. D. B. and M., for storage purposes, for irrigation use.

MODOC COUNTY—Howe Dam No. 169. W. A. Howe, Alturas, owner; crib dam, 5½ feet above streambed with a storage capacity of 30 acre-feet, situated on Pit River tributary to Sacramento River, for diversion purposes, for irrigation use.

MODOC COUNTY—Duke Reservoir No. 2. No. 163-2. Royal E. Williams, Likely, owner; earth fill dam, 11 feet above streambed with a storage capacity of 20 acre-feet, tributary to South Fork Pit River, for storage purposes, for irrigation and stock use.

LOS ANGELES COUNTY—Elizabeth Lake Dam No. 781. Barkman C. McCabe, Los Angeles, owner; earth dam, 18 feet above streambed with a storage capacity of 1000 acre-feet, situated on Elizabeth Lake tributary to Elizabeth Lake Canyon in Sec. 10, T. 6 N., R. 14 W., S. B. B. and M., for storage purposes, for recreation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of July, 1931.

SAN DIEGO COUNTY—Monte Vista No. 1 Dam. Sefton Investment Company, San Diego, owner; earth dam, 35 feet above streambed with a storage capacity of 10.8 acre-feet, situated on unnamed creek tributary to Sweetwater River in Sec. 31, T. 16 S., R. 1 E., S. B. B. and M., for storage purposes, for domestic and irrigation use. Estimated cost \$4,000, fees paid \$40.

SUTTER COUNTY—Wadsworth Dam No. 1-15. Sacramento and San Joaquin Drainage District, Sacramento, owner; flashboard weir dam, 17½ feet above streambed with a storage capacity of 162 acre-feet, situated on Wadsworth Drainage Canal tributary to Sacramento River in Sec. 15, T. 15 N., R. 2 E., M. D. B. and M., for storage purposes, for raising ground water use. Estimated cost \$8,730, fees paid \$87.30.

LOS ANGELES COUNTY—North Side Water Company No. 1 Dam No. 809. North Side Water Company, Walnut, Calif., owner; earth dam, 8 feet above streambed with a storage capacity of 12 acre-feet, situated on South Fork San Jose Creek tributary to San Gabriel River in Rancho San Jose, for storage purposes, for irrigation use. Estimated cost \$1,500, fees paid \$20.

SANTA CRUZ COUNTY—San Vicente Creek Dam No. 632-2. Coast Dairies and Land Company, Davenport, Calif., owner; concrete gravity dam, 19 feet above streambed with a storage capacity of 15 acre-feet, situated on San Vicente Creek in Ranchos San Vicente and Arroyo de la Laguna, for storage purposes, for irrigation use. Estimated cost \$3,257, fees paid \$32.57.

Application for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of July, 1931.

SHASTA COUNTY—False Lake Dam No. 223. O. Merlo, Redding, owner; earth dam, situated on North Fork Jenny Creek tributary to Sacramento River in Sec. 4, T. 31 N., R. 5 W., M. D. B. and M.

MODOC COUNTY—Duke Reservoir No. 163. Royal E. Williams, Likely, owner; earth dam, situated on Pit River in Sec. 9, T. 39 N., R. 13 E., M. D. B. and M.

PLACER COUNTY—Alta Forebay Dam No. 97-10. Pacific Gas and Electric Company, San Francisco,

owner; earth dam, located in Sec. 30, T. 16 N., R. 11 E., M. D. B. and M.

TUOLUMNE COUNTY—Lake Strawberry Dam No. 97-74. Pacific Gas and Electric Company, San Francisco, owner; rock dam, situated on South Fork Stanislaus River tributary to Stanislaus River in Sec. 15, T. 4 N., R. 18 E., M. D. B. and M.

TUOLUMNE COUNTY—Relief Dam No. 97-80. Pacific Gas and Electric Company, San Francisco, owner; rock dam, situated on Relief Creek tributary to North Fork Stanislaus River in Sec. 13, T. 5 N., R. 20 E., M. D. B. and M.

SANTA CLARA COUNTY—Lower Howell Dam No. 622-2. San Jose Water Works, San Jose, Calif., owner; earth fill dam, 30 feet above streambed with a storage capacity of 153 acre-feet, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

NEVADA COUNTY—White Rock Dam No. 97-49. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, 10.5 feet above streambed with a storage capacity of 578 acre-feet, situated on branch of North Creek tributary to Fordyce Creek in NE¼ Sec. 22, T. 18 N., R. 14 E., M. D. B. and M.

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of July, 1931.

MODOC COUNTY—Enquist Dam No. 158. Emil Enquist, Davis Creek, owner; earth and rock fill dam, 10½ feet above streambed with a storage capacity of 750 acre-feet, situated on a fork tributary to Oliver's Canyon in NE¼ Sec. 24, T. 47, R. 12, M. D. B. and M., for storage purposes, for irrigation and stock water use. Estimated cost \$1,000, fees paid \$20.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of July, 1931.

MONO COUNTY—Walker Lake Dam No. 532. Archibald Farrington, Mono Lake, owner; earth and rock dam, situated on Walker Creek tributary to Rush Creek in Sec. 7, T. 1 S., R. 26 E., M. D. B. and M.

CONTRA COSTA COUNTY—Port Costa Balancing Reservoir No. 581-2. California Water Service Company, San Francisco, owner; earth fill dam, 39 feet above streambed with a storage capacity of 41.7 acre-feet, located in SW¼ Sec. 3, T. 2 N., R. 3 W., M. D. B. and M.

MODOC COUNTY—Spaulding Dam No. 1. No. 154. R. D. Craig, Malin, Oregon, lessee; earth and rock dam, 5 feet above streambed, situated on unnamed drainage tributary to Tule Lake in Sec. 2, T. 42 N., R. 7 E., M. D. B. and M.

PLACER COUNTY—Alta Forebay Dam No. 97-10. Pacific Gas and Electric Company, San Francisco, owner; earth fill dam, 9 feet above streambed with a storage capacity of 15,122 acre-feet, situated on no stream in SW¼ Sec. 20, T. 16 N., R. 11 E., M. D. B. and M.

TUOLUMNE COUNTY—Lake Strawberry Dam No. 97-74. Pacific Gas and Electric Company, San Francisco, owner; rock fill dam, 132 feet above streambed with a storage capacity of 17,900 acre-feet, situated on South Fork Stanislaus River tributary to Stanislaus River in SW¼ Sec. 15, T. 4 N., R. 18 E., M. D. B. and M.

TUOLUMNE COUNTY—Relief Dam No. 97-80. Pacific Gas and Electric Company, San Francisco, owner; rock fill dam, 130 feet above streambed with a storage capacity of 15,122 acre-feet, situated on Relief Creek tributary to Middle Fork Stanislaus River in SW¼ Sec. 13, T. 5 N., R. 20 E., M. D. B. and M.

MODOC COUNTY—Duke Reservoir No. 163. Royal E. Williams, Likely, owner; earth dam, 10 feet above streambed with a storage capacity of 20 acre-feet, situated on a drainage tributary to Pit River in SE¼ Sec. 9, T. 39 N., R. 13 E., M. D. B. and M.

You owe so much to yourself that you can not afford to owe anyone else.

Auto Registrations Increase; \$8,823,591 Paid in Six Months

SUSTAINED increase in automobile registrations is noted in the monthly official report of the Division of Motor Vehicles. A gain is recorded of 39,563 registrations for the first six months of this year over those of 1930.

The following table reflects the gain or loss in registration by classifications:

	As of 6-30-30	As of 6-30-31	
Automobiles	1,830,096	1,855,236	25,140 gain
Pneumatic trucks	73,853	85,675	11,822 gain
Solid trucks	14,539	10,514	4,025 loss
Motorcycles	8,182	7,949	233 loss
Pneumatic trailers	32,521	39,054	6,533 gain
Solid trailers	8,821	7,737	1,084 loss
Automobiles—Exempt	30,903	32,612	1,109 gain
Motorcycles—Exempt	779	958	179 gain
Trailers—Exempt	3,861	3,923	122 gain
Transfers	263,081	269,490	6,409 gain

In the first six months of 1931, the Division collected \$8,823,591 from paid registrations, thus reflecting an increase of \$13,370 over the same period in 1930.

Apportionment of motor vehicle fees to the various counties and Division of Highways was made during the month. The sum divided was \$6,176,513. Of this amount, \$3,088,256 went to the Division of Highways and the other half was allotted each county in proportion to their registration count. Los Angeles received the largest share, with San Francisco second, Alameda third and San Diego fourth.

TO A HORSE

O Horse, you are a wondrous thing.
No horns to honk, no bells to ring;
No license buying every year,
With plates to screw on front and rear.
No spark to miss, no gears to strip;
You start yourself, no clutch to slip;
No gas bills mounting every day
To steal the joy of life away.
Your inner tubes are all OK
And, thank the Lord, they stay that way.
Your spark plugs never miss or fuss;
Your motor never makes us cuss.
Your frame is good for many a mile;
Your body never changes style,
Your wants are few and easily met—
You've something on the auto yet.

—Royal Arcanum Bulletin.

QUITE FUR

"Oh, constable, I feel so funny."

"What's the matter, madam? Have you vertigo?"

"Oh, yes, constable, about two miles."—*National Motorist*.

HERE'S HOW AUTO FEES WERE PAID TO COUNTIES

Following is a tabulation showing apportionment of motor vehicle fees to the counties for the period January 1, 1931, to June 30, 1931:

County	Total fee-paid registration	Counties' share of apportionment
Alameda	142,132	\$218,795 63
Alpine	93	143 16
Amador	2,729	4,200 98
Butte	14,561	22,414 96
Calaveras	2,165	3,332 77
Colusa	4,715	7,258 18
Contra Costa	25,267	38,895 60
Del Norte	1,663	2,560 00
El Dorado	3,142	4,836 74
Fresno	57,774	88,936 33
Glenn	5,350	8,235 70
Humboldt	14,709	22,642 79
Imperial	23,575	36,290 96
Inyo	2,694	4,147 10
Kern	35,005	53,886 11
Kings	9,552	14,704 18
Lake	3,251	5,004 54
Lassen	3,777	5,814 25
Los Angeles	821,937	1,265,276 11
Madera	6,531	10,053 71
Marin	11,353	17,476 62
Mariposa	1,240	1,908 84
Mendocino	7,220	11,114 35
Merced	14,703	22,633 55
Modoc	2,650	4,079 37
Mono	562	865 13
Monterey	21,121	32,513 32
Napa	8,179	12,590 62
Nevada	3,413	5,253 92
Orange	48,414	74,527 70
Placer	9,196	14,156 17
Plumas	2,583	3,976 23
Riverside	30,408	46,809 57
Sacramento	46,952	72,277 13
San Benito	4,362	6,714 78
San Bernardino	47,950	73,813 43
San Diego	75,624	116,414 32
San Francisco	149,030	229,414 30
San Joaquin	38,925	59,920 50
San Luis Obispo	11,986	18,451 05
San Mateo	26,197	40,327 23
Santa Barbara	26,620	40,978 38
Santa Clara	57,121	87,931 11
Santa Cruz	15,631	24,062 10
Shasta	5,427	8,354 23
Sierra	803	1,236 12
Siskiyou	7,970	12,268 88
Solano	13,532	20,830 94
Sonoma	26,679	41,069 21
Stanislaus	26,299	40,484 24
Sutter	6,206	9,553 41
Tehama	5,569	8,572 83
Trinity	848	1,305 40
Tulare	32,097	49,409 59
Tuolumne	2,973	4,576 59
Ventura	20,894	32,163 88
Yolo	9,783	15,059 79
Yuba	5,023	7,732 32

Total fee-paid..... 2,006,165 \$3,088,256 95

L. H. Gibson Tells of Work Activity In District Five

(Continued from Page 22, Col. 1)

story asphaltic concrete pavement. The contractor is The Hanrahan Company. Between Arroyo Grande and Pismo, the earth shoulders are being treated with fuel oil by the road mix method. W. A. Dontanville is the contractor.

On the Roosevelt Highway between San Simcon and Piedras Blancas Lighthouse, the surface of the road has been treated with fuel oil as a dust palliative. W. A. Dontanville was the contractor.

On the Coast Highway between the northerly limits of Arroyo Grande and Berros Creek plans are complete for the reconstruction of the highway with a 36-foot roadbed and a 20-foot reinforced concrete Portland cement concrete pavement. This project will substitute for a right-angle turn, a curve of 1800-foot radius, in the town of Arroyo Grande, and correct alignment at other places. This will also involve the construction of a new bridge across Arroyo Grande Creek.

SANTA BARBARA COUNTY: On the Coast Highway between Los Alamos and Wignmore, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. The work is about 40 per cent complete. Basich Brothers Construction Company is the contractor.

Between Gaviota and one mile north of Las Cruces the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. This work includes construction through Gaviota Canyon. Gist and Bell are the contractors. The work is nearing completion. Within the limits of this project there is being constructed a new reinforced concrete bridge across Gaviota Creek in the narrow portion of the canyon. Paul M. White is the contractor on the bridge under the supervision of the Bridge Department.

On the Cuyama lateral, between the second crossing of the Cuyama River and the Kern County line, a distance of 38 miles, the road is being surfaced with crush run base and oil rock surface 18 feet and 20 feet in width. The project is about 80 per cent complete. The Lang Transportation Company is the contractor. A portion of this project is located in San Luis Obispo County.

On the Cuyama lateral, between Buckhorn Creek and the second crossing of the Cuyama River, an armor coat is being applied to the road surface. J. F. Knapp is the contractor.

On the Coast Highway, between Gaviota Canyon and Tecolote Creek, bids have been received for the construction of oiled rock borders on each side of the pavement.

Visitor: "Who's that fellow out there who's swearing and blackguarding the workmen?"

Foreman: "That guy! He's an engineer."

Spelled DAM: Says she: "Isn't it wonderful how a single policeman can dam the flow of traffic?"

Says He: "Yes, but you should hear some of the motorists."

More Scotch: "Is there any truth in the report that Angus MacTavish bought the corner filling station?" "Well, I don't know for sure, but the 'Tree air' sign has been taken down."

District Six Reports Rapid Progress in Road Construction

(Continued from Page 22, Col. 2)

the other at Tipton Crossing at a point approximately eight miles south. It will also eliminate two right-angle turns at both crossings.

Construction of oil-treated rock borders on Route 10, about 12 miles east of Hanford, is being done by State forces and covers approximately three and one-half miles of widening the existing 15-foot pavement to 20 feet.

FRESNO COUNTY: Work on the Kings River road is proceeding in accordance with the schedule of progress. Approximately ten miles of road are completed or under construction. About five miles of new road is open to public traffic. The opening of three miles of this road recently for public traffic eliminates about four miles of old road which was very narrow and crooked.

Pacific Tank Lines, contractor for oiling work, are completing dust oiling from the west boundary to two miles east of Parkfield Junction.

MADERA COUNTY: No major road work in progress, but a contract is under way for replacing a concrete bridge crossing Bradley Slough about one mile south of Chowchilla. The old structure has been removed and the new one is in process of erection.

MERCED COUNTY: Major work in progress at this time consists of construction of an overpass separation at the Santa Fe crossing about one mile east of Merced on the Yosemite Route No. 18. This work is being performed by Contractor Mettowan. Oil-treated detours have been constructed and are in use, and the contractor has done considerable grading, besides driving a number of steel piles.

On Route No. 32 at the foot of Pacheco Pass road to the Gustine road, maintenance forces are widening shoulders to a minimum width of six feet, and constructing gravel shoulders preparatory to shoulder oiling contract, which has been awarded to Stewart & Nuss, for approximately 38 miles, from the east boundary of Merced County to the foot of Pacheco Pass on Route No. 32.

MARIPOSA COUNTY: A. Teichert and Son expect to finish their contract of sealing oil-treated crushed rock surfacing with 90-95 road oil and screenings on or about July 22. This work is on Yosemite Lateral Route No. 18, east of Mariposa. Maintenance forces have completed dust oiling from Orange Hill School to Mariposa and are now engaged in applying oil treatment to the surfacing between Mariposa and Lorene's Station on the Brieburg grade.

Bids were opened on July 15, 1931, for construction of a graded roadway from Orange Hill School to Pain Flat. This is the portion of the Yosemite Highway Route No. 18 in Mariposa County, the easterly terminus being about seven miles west of Mariposa. It lies on a new location which departs considerably from the existing road and will be built to a much higher standard.

Toll charges on the bridge across the Columbia River between Pasco and Kennewick, Washington, have been removed, it is stated, in a report received by the touring bureau of the Automobile Club of Southern California.



Steps taken by the Division of Water Resources to carry out its conservation plan, together with other activities of this department, headed by Edward Hyatt, State Engineer, are recounted in the official report for July. In other columns will be found details of the division's activities in connection with the recent visit of the Congressional Committee investigating the State's water problem. Here follows flood control and reclamation activities, tabulation of dam applications and irrigation news:

SACRAMENTO VALLEY

Early in the present year, through the medium of data secured from California cooperative snow surveys and available precipitation data of the U. S. Weather Bureau, State, districts and public utilities, the State Engineer's office prepared an estimate of the water situation, predicting that we could expect throughout the 1931 season to experience one of the driest years of record.

To prepare for all conservation of water possible, various departments of State and the water users themselves took cognizance of the situation and have been and are actively taking steps to meet the situation. The State Division of Water Resources and the Permanent Committee of the Sacramento-San Joaquin River Problems Conference representative of the water users throughout the Sacramento-San Joaquin territory are cooperating to effect conservation measures and provide for administration of the streams by a water supervisor. Letters have been sent in the name of the committee to all water users in the Sacramento-San Joaquin territory, advising them of the situation and recommending the most effective conservation measures possible.

The Rice Growers' Association of California has also forwarded a copy of the committee's letter with a supplementary recommendation to its entire membership. The Division of Water Resources likewise addressed a letter to its water right permittees calling attention to the possible necessity of regulating or suspending diversions in accordance with the priorities of the water rights. From the standpoint of the U. S. War Department, and its authority to maintain navigation, the department's representatives have also warned the water users that only with the utmost effort on their part to prevent waste and conserve water may the department be constrained to withhold drastic action in stopping irrigation diversions in order to maintain navigation.

Within the last few days the flow of the Sacra-

mento River at Sacramento has dropped to 200 second-feet or less, as shown by tidal cycle measurements, and corresponding to this record of low flow to the delta the salinity stations there have shown a very marked increase.

The intensive conservation campaign as planned early in the season among the water users above Sacramento and through the cooperation of the various conservation officers in the larger districts has continued, controllable waste has been practically reduced to nothing. There is a flow in the Colusa trough of about 200 second-feet made up mostly from seepage return and an effort is being made to reduce this by checking up the drains and installing booster pumps to lift the water from the drains to the canals, thereby permitting corresponding reductions in river diversions.

Although waste has been reduced to a minimum, the actual crop requirements appear to equal the entire in flow as well as return flow, so that the net flow at Sacramento is practically nothing. Under these conditions a present increase in the flow to the delta can apparently be accomplished only through an actual reduction in the upstream irrigated area.

The Feather River ceased to flow at Nicolaus, and negotiations entered into between the State Engineer, the lower water users and the directors of the Sutter-Butte Canal Company and Western Canal Company resulted in a voluntary agreement that these companies would limit their upstream diversion of water and thus release water for irrigation of the parched orchard lands along the lower river.

The summary of the results of this conference is that the Sutter-Butte and Western Canal Companies cut down their own use of water for a few days and diverters on the Feather River below Marysville cooperated with the State Engineer in the appointment of a water master to supervise and restrict diversions of water from the stream until the crisis passed.

The Pacific Gas and Electric Company agreed to send as much water downstream from Lake Almanor as it can use in generating electricity, thus assuring a consistent flow for the next month at least.

The water situation in Yolo County is also under discussion between the State Engineer and Yolo County officials. It may be that the county will enter upon an intensive investigation of the water resources of the county and a plan for their maximum economic utilization.

SANTA CLARA INVESTIGATION

Routine field work has been continued throughout the month on this investigation. When this investigation started in 1929, it was to be continued for three years. At the last session of the Legislature the act creating Santa Clara Conservation District was amended to allow it to issue bonds. They have now retained the

(Continued on Page 36)

Seventy-seventh State Fair Promises To be Most Colorful in its History

THE Seventy-seventh Annual California State Fair, first under the administration of Governor James Rolph, Jr., will be the most colorful in the history of California's exposition. It will be held in Sacramento, September 5 to 12.

One of the first acts of Governor Rolph on taking office last January was to program 1931 "Fiesta Year" in California. The State fair will be the crowning event of Fiesta Year.

As a result of the interest shown by the State administration in the State Fair, many improvements have been made at the Fair Grounds. The State is completing a \$200,000 building program which will give the fair two new buildings—a Sheep and Swine Building and a Poultry Building, which will be ready for the opening.

CARE OF PUBLIC

As the official governmental head of the State Fair, Rolland A. Vandegrift, Director of the State Department of Finance, has given attention to a number of improvements for the comfort and convenience of exhibitors and the public.

The State Fair this year will be colorful because of the many special attractions and features. The horse racing program is declared by racing fans to be the best in the fair's history.

The fair will display before the eyes of hundreds of thousands of visitors California's manifold products and almost limitless resources. Counties from the Mexican border to the Oregon line will display horticultural, agricultural and manufactured products as well as featuring recreational advantages.

PLAN NEW EXHIBIT

Charles W. Paine, secretary-manager of the fair, announces that exhibitors in the nineteen departments and entrants in the various contests will share in premiums and purses totaling \$125,000.

The Department of Public Works is arranging an exhibit, practically new over any heretofore shown, since nearly all its previous exhibits were destroyed by the recent fire at the fair grounds.

The entertainment program includes a daily delayed parachute drop by E. H. "Speed" Manning of Los Angeles, who will attempt to break his own world's record of falling 15,656 feet before opening his parachute.

Another feature attraction will be the personal appearance, Sunday afternoon, September 6th, of Lee S. Roberts, famous song writer, and his radio artists of the "Sperry Smiles" program. Roberts will present Governor Rolph with the original manuscript of his song "Smiles."

INCREASED EXHIBITS

The night horse show will bring increased competition, with \$20,000 in prizes to be distributed. Fifth place has been added to each class, which will increase the opportunity for the smaller stables to participate in the awards.

Under the leadership of the Tractor and Implement Club, the farm machinery show will surpass any event of this kind ever held in the State. Applications for space show an increase in the exhibits. A special entertainment program will be carried out daily in the Farm Machinery Building.

The California State Fair now has one of the finest exposition plants in the Nation. The new permanent buildings have replaced wooden structures in virtually all departments, giving the most modern exhibit facilities. Road improvements are being carried out and the parking space by which automobiles may be driven and parked inside the grounds, is being increased.

CUBA'S NEW HIGHWAY

The new Central Highway just completed in Cuba is one of the largest and most important works of its class on the American continent, stated M. A. Corcades, chief engineer, department of roads and bridges, Havana, Cuba, in a report to the American Road Builders' Association.

It has a length of 1139.5 kilometers. From the city of Pinar del Rio, in the westernmost province, to the city of Santiago de Cuba, in the easternmost province, it passes through 60 cities and towns and through vast and fertile lands, where natural dirt roads were the only means of communication.

Work began in May, 1927, was finished in February, 1931, and the highway was formally opened March 15, 1931.



FAIR ENOUGH! Knowing which section of this picture will be studied first, let it be known that the one on the left is Miss Naomi Sterling. Her aide is Miss Peggy Peterson. The scenery?—An airplane picture of the State Fair Grounds. Note the new Live Stock Building at the upper right-hand corner and the newly completed poultry structure at the bottom on the left. The Department of Public Works is planning a bigger and better exhibit this year.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
ERIC CULLENWARD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 AUGUST, 1931 No. 8

CRAZY DRIVING

Figures on automobile accidents, fatal and otherwise, are not encouraging.

There never will be any better reason for more accidents or less, than more carelessness or greater care. When accidents increase, care is decreasing; and only greater care will produce fewer accidents.

When you see some of the driving that is visible at almost any hour of any day, there is no wonder that there are accidents. The only wonder is that there are not more.

Too many are speeding through city streets. A car at twenty-five or thirty miles an hour may be easy to control at intersections, while a car going just a little faster is beyond control when something happens suddenly.

Too many are dashing across street intersections with the drivers as stupidly heedless of contingencies as though theirs were the only cars in the world.

And some of the worst offenders are the young drivers of light delivery trucks. Drivers of big trucks for big houses go to safety school and are out for safety records. They do very well. Drivers of many smaller trucks for smaller houses obviously go to no safety school, and seem to be out for killing records.

What's the hurry?—*Texas Highways.*

* * *

Wanton wasting of water, anywhere in California, should bring reprehension of the public upon the person or corporation guilty of this waste. This State needs every gallon of available water. Shortage of precipitation through a period of several years has brought upon the State an acute water situation. There is no excuse for becoming unduly alarmed. But there is every reason for all the people to be extremely careful not to waste water.—*Long Beach Press-Telegram.*

Procession of Cars From Other States Aid to Prosperity

(From Arroyo Grande Herald-Recorder)

FEW can doubt the value of California scenery and good roads if they will spend even a short time watching the cars passing through Arroyo Grande almost any day in the week from other states of the Union.

Sunday the editor checked three cars from New York, two from British Columbia, two from Maryland, three from Texas, one from Arizona, one from Colorado, four from Oregon, four from Washington, two from Illinois, one from Minnesota and two from Nebraska, while parked for one hour on the State highway at the west city limits near the cemetery.

That should represent in a fairly accurate manner the traffic that is now passing into and through the State, for there was no reason why there should have been more out-of-state cars on a Sunday on that particular stretch of highway than on any other day on any other highway, for tourists select no particular day of the week for making their journeys.

When the number of out-of-state cars passing over this highway in this short time is considered, how many must there have been upon the thousands of miles of paved highway throughout California on that day?

These cars mean business for the communities they pass through.

* * *

Spending of \$29,000,000 this year by the State Department of Public Works is putting money in circulation. As long as the State is disbursing funds for worthy construction there can be no complaint from the taxpayers. Now is the time to build, and build wisely for the future.—*Sausalito News.*

WORLD AUTO CENSUS

World registration of motor vehicles totals 35,805,632, of which 26,697,398 were registered in the United States, according to a world census report just received by the California State Automobile Association. The census reveals a per capita registration of one motor vehicle for every 54 persons in the world, with the United States credited with one registration for every 4.59 persons against one for every 200 persons resident in all foreign countries. Another important fact is that despite the adverse economic conditions prevailing throughout the world during 1930, registration of motor vehicles increased by 678,234 over 1929.

Courtesy Monopoly Broken

Flock of Engineers Steps Into Print to Demand Word of Praise for Road Men

THE BOYS of the Highway Patrol better sit up and take notice. Their field is being invaded.

We are accustomed to turning to the Highway Courtesy Letters page for deeds of gallantry. We thought the motoreyele lads had a virtual monopoly on that kind of reading.

And now comes a flock of district engineers and upsets the apple cart.

"HEAVY DUTY" DONE

Mr. F. G. Somner of District 9 sends in a letter from Miss L. L. Norris, director of the Touring Department of none other than the National Automobile Club, itself a service organization. Miss Norris has most kind words to say of one of the brave lads of the Highway Division. "Bill" Finch, heavy duty equipment operator in Somner's district. The letter explains the "heavy duty" done by Bill. Here it is:

Dear Mr. Somner:

I wish to express to you my sincere appreciation for service and assistance rendered to me last Friday by one of your employees, Mr. Finch.

While driving over Tioga Pass, about half way to the summit, experienced motor difficulties, and my knowledge of an automobile being limited to operating it and not including its inner workings, was somewhat at a disadvantage. After sitting there about 10 minutes, Mr. Finch stopped and asked if he could be of assistance. After working very diligently, he located the trouble in the pump and soon remedied it, enabling us to continue on our way.

It was not only the fact that he rendered invaluable assistance, but the very courteous way in which it was done, that meant so much, and you are to be complimented on having such a courteous and capable employee.

AID FOR DISTRESSED

Then Mr. R. E. Pierce of District 10 gets a cheer from Dr. I. I. Lasdan of San Francisco, whose letter says:

Please permit me to express my sincere thanks and appreciation for the valuable service you have rendered in the patrol of Ebbetts Pass during the July 4th holiday.

I specially want to commend one of your men, Mr. L. O. Petersen, covering that section, for the aid he has rendered in our distress.

My automobile broke down at the summit. Mr. Petersen happened to come along about 4 p.m. For

Highway Patrol's Thunder Is Stolen When "Heavy Duty Bill" Finch Does Gallant Deed

three hours he worked and made every effort to start it; we finally had to abandon it by the wayside and were taken to Markleeville in his truck.

A warm expression of thanks for courtesy extended has been received by Mr. L. H. Gibson, district engineer at San Luis Obispo, from A. Marks of Taft, who writes:

Just recently I was the recipient of a courtesy from one of the employees of the Highway Division working out of your district. I have occasion to make the trip from here to Santa Cruz Mountains, where my home is located, many times during the year. A few weeks ago I was coming to Taft from Paso Robles and had a flat tire. I was too ill to change it myself. One of the highway trucks came along and upon my request Mr. J. R. Berry, located at Shandon, had the tire changed for me.

It is not only an object lesson that one must not lose faith in humanity, but that "He profits most who serves best," and I assure you that this courtesy on the part of one of your employees is sufficient evidence that he is the right man in the place that he occupies.

GOOD SAMARITAN

Four gentlemen, Dr. Jack Frost and Messrs. R. A. Crosby, Bob Johnston and Francis McElloeh, all of Los Angeles, report a Good Samaritan deed as follows:

Your office undoubtedly receives numerous complaints. For a change, here's one that is commendation and not a complaint.

Our party of four were fishing in Saddlebags Lake near the top of Tioga Pass. Fishing was good and we stayed until the last dog was hung. About half way down the Tioga grade near what is known locally as the "Big Blue Slide," we found the road closed and were informed by your general foreman, Mr. Paul Peak, that it would be impossible to cross before noon the next day.

One of the party was ill and we were extremely anxious to get to a lower elevation. Mr. Peak's car was trapped at the lower end of the slide, while we were above. He volunteered to use his own car, walk the party in question over the slide and haul them to Mono Lake. He furthermore extended to us the hospitality of the construction camp, such as it was.

We accepted his hospitality, were put up for the night, and both Mr. and Mrs. Peak bent every effort to make us comfortable, even to preparing breakfast the following morning.

Almost anyone may be genial and good natured when everything goes well, but when a man has put in a full day's work, several hours overtime, and is faced with the prospect of an all-night task and can still be as thoroughly polite and considerate as Mr. Peak, he certainly deserves special commendation.

Water Problems of Various Counties

(Continued from Page 31)

services of an engineer, and he is working on a plan for development of the valley, and it may be that the State's investigation will not be continued during the coming season.

NAPA VALLEY INVESTIGATION

Readings of water levels in various wells and intermittent stream flow measurements have been made on the Napa River, Rector and Conn creeks. A meeting was had with the Board of Supervisors for the purpose of arriving at some agreement with respect to future cooperation. The Board of Supervisors of Napa County feel that the investigation should be continued until there is a wet year and propose to appropriate funds for the coming biennium under the agreement between the State and the county which began in 1929. It was originally proposed to continue the investigation for a three-year period which the coming year will terminate. It is not known at the present time how intensively the investigation will be carried on during this fiscal year.

SOUTH COASTAL BASIN INVESTIGATION

A report was completed on the work necessary for determining the possibility of salt water intrusion from the ocean into the pumping area of Orange County. The cost of the most necessary part of such investigation was estimated at \$19,000 and the matter was laid before the Orange County Cooperative Committee for presentation to the Board of Supervisors of Orange County as a basis for a request to appropriate the sum of money necessary to carry on the work. This investigation was made at the request of the committee. Additional special work was done on the matter of salt water intrusion along the entire coast line of South Coastal Basin.

VENTURA COUNTY INVESTIGATION

The Board of Supervisors of Ventura County made the unexpended balance as of July 1 of the money appropriated by them last year for the investigation, available to the State to match a similar amount provided for in the budget, which requires that cooperative funds must be deposited in the State treasury before State funds can be made available. The investigation is on a fifty-fifty financial basis, the appropriation by the State for the biennial period being \$25,000, and the county proposing to appropriate a like amount.

Drilling with a Calyx drill was started at Devil Canyon site on Piru River. The reservoir sites on Piru River have been a matter of special interest to the people of Ventura County because the new highway location of the ridge route will pass through one of three possible sites. The State, with the cooperative funds provided, will investigate all three sites.

SANTA BARBARA

The Board of Supervisors of Santa Barbara County has appropriated \$15,000 to match a similar amount of State funds provided in the budget for the investigation of the water resources of Santa Barbara County during the present fiscal year. A total amount of \$25,000 has been appropriated in the budget for the investigation of the water resources of Santa Barbara County during the biennium, the county of Santa Barbara proposing to make available a similar amount. These funds will be expended in making the investigation and laying out a coordinated plan for the development and maximum utilization of the water resources of Santa Barbara County.

MONTEREY AND SAN LUIS OBISPO COUNTIES

The Board of Supervisors of Monterey County has appropriated \$2,500 and the Board of Supervisors of San Luis Obispo County has appropriated \$1,000 for the investigation of the water resources of these two counties, with the exception of that portion of San Luis Obispo County south of the headwaters of Salinas River. The State has appropriated in the biennial budget \$7,500, which will become available when matched by funds from the counties referred to above.

WATER RESOURCES REPORTS

Satisfactory progress has been made in completing the reports on the water resources investigation covering the State water plan for the coordination, development, conservation and utilization of the water resources of the State authorized under the provisions of Chapter 832 of the Statutes of 1929. Two additional bulletins have been completed during the present month and are now available for distribution. They are:

Bulletin 25—"Report to the Legislature of 1931 on State Water Plan."

Bulletin 36—"Cost of Irrigation Water in California."

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento and San Joaquin Drainage District—Small crews have been engaged in routine maintenance work consisting of cleaning canals, cutting noxious weeds and making minor repairs to structures. Irrigation of the willows planted for levee protection on the east levee of the Sutter By-pass has continued with the operation of four small pumps.

Sacramento Flood Control Project—On June 27th construction started on the weir in the Wadsworth

Move Made to Extend Snow Surveys

(Continued from Preceding Page)

Canal which is being built for the Reclamation Board. At this time all pile driving has been completed and flume and coffer dams have been constructed to take care for the flow of water in the canal. The site has been unwatered and excavation and form work for concrete will be commenced. At this date the work is approximately 50 per cent complete. Investigations were made and reports rendered on several applications before the Reclamation Board.

DAMS

To date 769 applications for approval of existing dams have been filed; 72 for approval of plans and specifications for construction or enlargement; and 163 for approval of plans for repairs or alterations.

APPLICATIONS FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF DAMS

Dam	Owner	County
Wadsworth	Sacramento-San Joaquin Recl. Dist.	Sutter
Monte Vista No. 1	Sefton Investment Co.	San Diego

APPLICATIONS FOR APPROVAL OF PLANS FOR REPAIRS OR ALTERATIONS

Dam	Owner	County
Lake Norconian, West	Rex B. Clark	Riverside
South Lambert	The Irvine Co.	Orange
Walker Lake	Archibald Farrington	Mono
False Lake	O. Merlo	Shasta
Duke Reservoir	Royal E. Williams	Modoc
Alta Forebay	Pacific Gas and Electric Co.	Placer
Lake Strawberry	Pacific Gas and Electric Co.	Tuolumne
Relief	Pacific Gas and Electric Co.	Tuolumne

PLANS APPROVED FOR CONSTRUCTION OR ENLARGEMENT OF DAMS

Dam	Owner	County
Upper Alameda	City and County of San Francisco	Alameda
Creek Div. Enquist	Emil Enquist	Modoc

PLANS APPROVED FOR REPAIRS OR ALTERATIONS

Dam	Owner	County
Round Valley	Pacific Gas and Electric Co.	Butte
Devils Gate	L. A. County Flood Control Dist.	Los Angeles
San Jacinto	J. C. Agee	Riverside
Lake Norconian, West	Rex B. Clark	Riverside
Walker Lake	Archibald Farrington	Mono

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

During the past month the regular field work has continued, comprising measurements of all diversions, stream flow, and return water throughout the Sacramento-San Joaquin territory.

The salinity sampling in the Sacramento-San Joaquin delta has been extended so that at present samples are being received from fifty-nine stations. The accompanying tables show the comparison between 1931 and 1924 stream flow and salinity data.

Discharge in Sec.-Ft.

Station	1931	1924
Sacramento River at Red Bluff	7/14 2,700	7/14 2,980
Sacramento River at Butte City	7/14 1,130	7/14 1,630

Discharge in Sec.-Ft.

Station	1931	1924
Sacramento River at Colusa	7/17 900	7/17 1,590
Sacramento River at Knights Landing	7/15 330	7/15 1,130
Sacramento River at Verona	7/20 300	7/20 ----
Sacramento River at Sacramento	7/20 50	7/20 919
Feather River at Nicolaus	7/20 0	7/20 32
American River at H St. Bridge	7/20 90	7/20 10
San Joaquin River near Vernalis	7/20 220	7/20 408
Combined flow of Sacramento River at Sacramento and San Joaquin River near Vernalis	7/20 250	7/20 1,330

Salinity Tests Sacramento-San Joaquin Delta

	Salinity in parts of chlorine per 100,000	7/14/31	7/14/24
Bullhead Point	1,500	7/14/31	7/14/24
O and A Ferry	980*	905	
Collinsville	810	796	
Emmattson	290*	464	
Three Mile Slough Bridge	430		
Rio Vista Bridge	315	302	
Liberty Ferry	58		
Isleton	146	114	
Antioch	710	614	
Jersey	430	296	
Webb Pump	245	165	
Central Landing	60	56	

* July 10th.

Within the last few days, the flow of the Sacramento River at Sacramento has dropped to 200 second-foot or less as shown by tidal cycle measurements, and corresponding to this record low flow to the delta, the salinity at stations there has shown a very marked increase. The additional salinity stations have been added to record completely the encroachment of the salt, and special attention will be given to determination of the upper limits of the encroachment. Daily sampling has begun at Freeport and special traverses are being made from Paintersville Bridge to Sacramento to show the present rate of encroachment.

CALIFORNIA COOPERATIVE SNOW SURVEYS

Negotiations have been made with some of the cooperating agencies for certain extensions in the surveys involving the location of additional snow courses, shelter cabins, etc.

A conference was held at Ash Mountain, Sequoia National Park, between representatives of the Park Service, Tulare Lake Water Storage District, Kings River Association and the State, relative to future work in south and middle Kings River basins.

Arrangements were completed for the construction of a much needed shelter cabin on the route of the Blue Lakes survey.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE WATER

Nineteen applications to appropriate water were received during the month of June, nine were with-

Irrigation and Water Storage News

(Continued from Preceding Page)

drawn or canceled and nineteen were approved. Four permits were revoked and thirty-five passed to license.

Among the applications received there was one for agricultural purposes by Stevinson Water District, 315 Chancery Building, San Francisco, to appropriate 175 cubic feet per second from McCoy Spillway, Arena Spillway, Livingston Drain, Bear Creek, Owens Creek, Duck Creek and Deadman Creek, tributary to San Joaquin River in Merced County, for the irrigation of 20,698 acres at an estimated cost of \$50,000.

There were two mining applications received for comparatively large amounts of water—one by D. R. Morrison and W. J. Cooley, c/o Daniel M. Hunsaker, Attorney, Rowan Building, Los Angeles, for 50 cubic feet per second from Elk Creek, tributary to Illinois River in Del Norte County, and the other by Magestic Mines Company of Weaverville for 100 cubic feet per second from Rush Creek, tributary to Trinity River in Trinity County, at an estimated cost of \$50,000.

Following are the more important applications approved:

One by Geo. F. Taylor of Downieville, allowing 50 cubic feet per second from Cherokee Creek, tributary to North Fork of Yuba River, for mining purposes.

One by Estelle I. Fraser of Coulterville, allowing 30 cubic feet per second from North fork of Merced River for power purposes.

Three by Florence Hogue of Los Angeles for a high-class subdivision in Monterey County: One allowing three cubic feet per second from Bixby Creek for power purposes at an estimated cost of \$9,000; one allowing one cubic foot per second from Bixby Creek, Cross Canyon, Daily Gulch and Bear Trap Canyon for domestic purposes at an estimated cost of \$22,000, and another allowing one cubic foot per second from Sierra Creek for domestic purposes at an estimated cost of \$8,000.

Inspections of projects under permit proceeded during the month in Butte, Glenn, Humboldt, Lake, Mendocino, Napa, Placer, Sacramento, Siskiyou, Sonoma, Sutter and Yolo counties.

ADJUDICATIONS

Los Alamos Creek (Santa Barbara County). Division's report as referee has been submitted to the Superior Court and a decree is expected in the near future.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). All but two of the water users have signed a stipulation for consent judgment.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted at the conference held at Cedarville on March 16, 1931.

Franklin Creek (Modoc County). Administration of the schedule of allotments for trial distribution during the 1931 irrigation season was continued throughout the month.

New Pine Creek (Modoc County). Field work on the investigation of the water supply and use of water on New Pine Creek was continued throughout the month.

Eagle Creek (Modoc County). Field work on the Eagle Creek investigation was continued throughout the month. A plane table survey of the ditches and irrigated lands was commenced late in June and is now nearly completed.

IRRIGATION, WATER STORAGE DISTRICTS

Office conferences were had concerning the feasibility of organizing an irrigation district in the vicinity of Arbuckle, Calusa County, and a water conservation district near Yuba City in Yuba County.

Field visits for the purpose of obtaining information, conferences or for the investigation of matters relating to their interests were made to the following irrigation districts: South Montebello, Walnut, La Canada, Palmdale and Little Rock Creek irrigation districts, Los Angeles County; Mojave River irrigation district, San Bernardino County; Alpaugh irrigation district, Tulare County; James, Stinson, Riverdale, Laguna and Fresno irrigation districts, Fresno County; Turlock and Modesto irrigation districts, Stanislaus County; South San Joaquin and Woodbridge irrigation districts, San Joaquin County; Richvale irrigation district, Butte County; El Camino irrigation district, Tehama County; Anderson-Cottonwood irrigation district, Shasta County.

At a meeting of the California Bond Certification Commission held on June 29 at San Francisco the following matters were referred to the commission and favorable action taken thereon:

Nevada Irrigation District: Approval of order validating bonds of the district in the sum of \$50,000.

Approval of emergency expenditures by the district for development work in the district, \$50,000.

Approval of refunding bond issue of the district in the total amount of \$8,100,000.

Scott Valley Irrigation District: Approval of refunding bond issue of the district in the total amount of \$69,000.

FEDERAL COOPERATION

In connection with the Federal-State cooperation for irrigation investigations, an inspection was made in the early part of this period of the work being done in the Santa Ana, San Gabriel and Mojave River areas. The work in northern California in the Sacramento-San Joaquin delta has been reviewed and an agreement reached as to its conduct in the coming season.

In connection with the Federal-State cooperation for stream gaging, the program for the 1931-1932 season has been outlined. Certain phases, such as the quality of water investigation and the new stations to be established, are under discussion. A trip was made to arrange for the maintenance of a station on Kings River near Hume, and to select a site for a new station to be established on Kings River just above the North Fork. The Hume station has been maintained up to this time by the city of Los Angeles.

Constant Reminder to Public Brings Reduction in Forest Fire Hazards

WRITING in the June edition of the CALIFORNIA HIGHWAYS AND PUBLIC WORKS, Highway Commissioner Phil A. Stanton said:

"It has been a great thing for California, this highway system."

Now comes State Forester M. B. Pratt, executive secretary of the California Fire Emergency Committee, and says:

"It is a great thing for California, this highway system."

"Moreover," says the State Forester, "it always will be a great thing for California, this highway system, for other agencies seeking solutions to several grave problems confronting the State will turn to the State highway system as a vital factor in solving their problems just as we have found the highways to be an educational medium for reaching the people in fire prevention work."

PRESS AND HIGHWAYS

"On and along the State highway system and with the press we are getting our closest contact with the people in the educational fire prevention campaign. The press reaches the people with the written word; the highways, with the spoken word."

According to forest officials, the intensive educational work on fire prevention on and along the highways is already showing good results in fire records. **Very few fires are now being reported as originating from carelessness on the part of motorists using the highways.**

Forest officials go further and declare the motorists when they scatter from the highways to the recreational areas carry with them the training received on and along the highways against causing fires.

CAUTION REQUESTED

Motorists entering the State at the border stations, both motor vehicle checking and agricultural quarantine inspection, are greeted by highway patrolmen and quarantine inspectors who courteously request them to use every caution against causing fires. Fire prevention literature is also distributed.

This highway educational work is given through the courtesy of the Department of

Agriculture and the Division of Motor Vehicles, two coordinated State agencies working under the Governor's proclamation.

As the motorist travels the highways and stops at any automobile house for sales, service, repairs or storage, he will see a copy of the Governor's proclamation conspicuously posted and will be reminded of the State campaign against fire by the attendant in charge.

CONSTANT REMINDER

Traveling the highways between automobile houses, the motorist stopping for supply at the service stations will again be reminded of the fire hazard in California this summer and cautioned against causing fire.

The State Chamber of Commerce, cooperating with large oil companies, sponsored this educational work along the highways and distributes fire prevention literature.

On May 26, Superintendent E. Raymond Cato of the California Highway Patrol issued Headquarters General Order No. 113 to all patrol officials wherein patrolmen are instructed to

(1)—Exercise special vigilance in preventing fire.

(2)—Apprehend violators of section 384 of the Penal Code.

(3)—Warn motorists to use ash receptacles.

(4)—Assist forest officials in establishing lines of communication.

(5)—Direct traffic in fire emergencies.

(6)—Caution nonresidents at border checking stations against fire.

Other than transportation facilities, State Forester Pratt points out three ways in which the highways are serving the fire prevention campaign:

1. First line of defense in both fire prevention and fire suppression as outlined by Director Walter E. Garrison of the Department of Public Works.
2. Law enforcement measure as outlined by Superintendent E. Raymond Cato of the Division of Highway Patrol.
3. Established educational centers by coordinated State agencies and cooperative organizations against fire starting.

What the Motorist Should Know

MOTORISTS of California are urged by E. Raymond Cato, Superintendent of the California Highway Patrol, to acquaint themselves with important provisions of the law relative to lights which became effective with the new Motor Vehicle Act August 14.

Outstanding in importance are the new regulations designed to promote greater safety in the transportation of loads that extend beyond the bodies of trucks. Inspector Will R. Sharkey, Jr., head of the Bureau of Lights of the California Highway Patrol, offers the following as explanatory of some of the most important phases of the new law:

Loads projecting four feet or more beyond the rear of a vehicle must display two red lights instead of one that are visible 500 feet to the sides as well as the rear.

DISPLAY RED FLAG

In daytime a red flag or cloth not less than 16 inches square must be used. Officers will have particular instructions to enforce these provisions.

Only white or approved amber-colored lights are permitted on the front of vehicles except the red lights of authorized emergency vehicles and colored lights of clearance lamps and approved signal devices.

All lights displayed from the rear shall be red except the clearance lights and approved signal devices.

Side or parking lamps shall not be lighted at the same time head lamps are burning. Parking lights may not be more than three candlepower, must be of white light and must not glare or dazzle.

WHITE OR GREEN

Vehicles may display running board or "courtesy" lights not greater than three candlepower. White or green are the only colors permissible and they must not glare or be visible except from the side.

Vehicles having a load width in excess of 80 inches shall carry clearance lights on the left side of the vehicle beginning one-half hour after sundown and at all times when there is not clear visibility for 200 feet. They must be blue, located at the front and rear with a visibility of 500 feet, and showing to the side as well as to the front or rear.

CALIFORNIA'S already extremely liberal policies toward the out-of-state motorists have been broadened and expanded materially by the new Motor Vehicle Act.

The new law, in many instances, practically doubles the time the nonresident may drive in California without paying for a California license.

Under the old legislation drivers of out-of-state cars could operate for a period of six months in California without taking out a license if such six months period did not extend beyond the end of the calendar year.

The new law changes this, by permitting the out-of-state driver to operate his car as long as the plates he is displaying are good in the state from whence he came.

Thus a motorist arriving here in January from New York with plates issued to him in his home state for that year, will be able to operate in California until the following January without getting new plates. This privilege is extended to all who secure a visitor's permit within five days after arrival.

This amendment, it is believed, will encourage more tourists to come to California.

Under the old law, the owner of out-of-state vehicle used for commercial purposes was required to obtain a California license immediately. This is changed under the new law to permit him to take out short-term licenses for 30, 60 or 90 days by paying a proportionate part of the regular annual fee.

This change is of decided benefit to the owner of a truck or other commercial vehicle who enters the State for short periods.

Registration certificates issued to the owner of the out-of-state car must be of a distinctive color and different from the colors issued for California cars. These will be blue for certificates of registration and golden rod for certificates of ownership.

Business conditions apparently are having little or no effect on California's annual "tourist crop" this season.

Records of the division show visitors' permits had been issued for 39,353 out-of-state cars up to July 1st of this year. It is estimated each car brings an average of three persons to the State.

Highway Bids and Awards for July

CALAVERAS COUNTY—Between 1.4 miles north of Calaveritas Creek and 1.4 miles south of Calaveritas Creek to be surfaced with bituminous treated crushed gravel or stone. About 2.8 miles in length. Dist. X, Rt. 65, Sec. B, C. E. Reed, Tracy, \$13,177; Wm. J. Schmidt, Berkeley, \$12,437; A. Teichert & Son, Inc., Sacramento, \$13,708. Contract awarded to Geo. French, Jr., Stockton, \$11,241.

COLUSA COUNTY—Between 12 miles and 5 miles west of Williams. About 6.6 miles to be surfaced with gravel. Dist. III, Rt. 15, Secs. D & E, Fred W. Nighbert, Bakersfield, \$63,111; Hemstreet & Bell, Marysville, \$64,937; A. Teichert & Son, Inc., Sacramento, \$53,337; Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$47,550; Granite Construction Co., Ltd., Watsonville, \$67,570; Force Construction Co., Piedmont, \$25,550; Kennedy Construction Co., Oakland, \$59,031; C. W. Wood, Stockton, \$44,950. Contract awarded to Capital Construction Co., Sacramento, \$39,997.

EL DORADO COUNTY—Between Riverton and Kyburz. About 8.6 miles to be surfaced with bituminous treated crushed gravel or stone (road mixed). Dist. III, Rt. 11, Sec. G, C. E. Reed, Tracy, \$39,093; Hemstreet & Bell, Marysville, \$41,474; Harold Smith, St. Helena, \$38,409; A. Teichert & Son, Inc., Sacramento, \$41,990; F. W. Nighbert, Bakersfield, \$46,785. Contract awarded to Tiffany, McReynolds & Tiffany, San Jose, \$33,792.

EL DORADO COUNTY—Between Mays and Nevada State line. About 5.2 miles to be surfaced with bituminous treated selected surfacing and between Bay View Rest and one mile north of Eagle Falls. About 1.8 miles existing surfacing to be bituminous treated. Dist. III, Rts. 11, 38, Secs. K & B, Hemstreet & Bell, Marysville, \$46,450; Basalt Rock Co., Inc., Napa, \$42,423; Fred W. Nighbert, Bakersfield, \$41,968. Contract awarded to Force Construction Co., Piedmont, \$37,157.

IMPERIAL COUNTY—Between Dixieland and Holtville and between El Centro and 4 miles west of Westmoreland. About 43.2 miles of oil treated crushed gravel or stone borders to be constructed. Dist. VIII, Rts. 12, 27, 29, Secs. C, F, G, H & A, Oswald Bros., Los Angeles, \$160,892; Steele Finley, Santa Ana, \$141,912; Griffith Co., Los Angeles, \$150,356; Southwest Paving Co., Los Angeles, \$158,652; George Herz & Co., San Bernardino, \$138,137; Fred W. Nighbert, Bakersfield, \$162,765. Contract awarded to R. E. Hazard Construction Co., San Diego, \$135,587.

KERN COUNTY—Between Democrat Springs and Weldon. About 30.6 miles to be treated with heavy fuel oil. Dist. VI, Rt. 57, Secs. H & I, Square Oil Co., Inc., Los Angeles, \$23,871; G. W. Ellis, Los Angeles, \$12,296; P. J. Akmadzich, Los Angeles, \$11,660; Valley Paving and Construction Co., Fresno, \$11,532; Crane Service Co., Los Angeles, \$11,236; Fred W. Nighbert, Bakersfield, \$13,144. Contract awarded to Oilfields Trucking Co., Ltd., Taft, \$9,879.

LASSEN COUNTY—Between Doyle and Long Valley Creek. About 7.5 miles to be oiled, about 4.3 miles to be surfaced with selected material. Dist. II, Rt. 29, Secs. D & E, C. A. Ladeveze, Los Angeles, \$20,455; Tibbitts Construction Co., San Francisco, \$24,401; Long Transportation Co., Los Angeles, \$520,404. Contract awarded to Morrison-Knudsen Co. and Macdonald & Kahn, San Francisco, \$18,657.

LOS ANGELES COUNTY—Between Piru Creek and Gorman. About 12.5 miles to be graded. Dist. VII, Rt. 4, Secs. I & J, George Pollock Co., Sacramento, \$557,614; Von der Hellen & Pierson, Castaic, \$506,434; Gibbons & Reed Company, Burbank, \$629,065; H. W. Rohl Company, Los Angeles, \$503,075; Granfield, Farrar & Carlin, San Francisco, \$515,658; Healy, Tibbitts Construction Co., San Francisco, \$241,401; Long Transportation Co., Los Angeles, \$520,404. Contract awarded to Morrison-Knudsen Co. and Macdonald & Kahn, San Francisco, \$459,772.

MADERA COUNTY—Steel stringer bridge across Fresno River at Madera. Consisting of 10-41'-0" and 2-40'-9" spans on steel pile bents. Dist. VI, Rt. 4, Sec. D, Peter McMueh, San Francisco, \$45,540; Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$40,694; J. S. Metzger & Son, Los Angeles, \$37,816; Merritt-Chapman & Scott Corp., San Pedro, \$42,568; A. W. Kitchen, San Francisco, \$38,866;

Gist & Bell, Arcadia, \$44,465; M. B. McGowan, San Francisco, \$39,757. Contract awarded to Gutleben Bros., Oakland, \$37,790.

MARIN AND SONOMA COUNTIES—Repair bridge across Petaluma Creek at Green Point. Replace floor on bascule span and repairs. Repairs and additions to operating equipment. Dist. IV, Rt. 8, Sec. A, Butte Construction Co., San Francisco, \$20,789; Healy, Tibbitts Construction Co., San Francisco, \$21,347; The Duncanson Harrelson Co., San Francisco, \$24,726. Contract awarded to Gutleben Bros., Oakland, \$19,828.

MARIPOSA COUNTY—Between Orange Hill School and Pain Flat. About 7.4 miles to be graded. Dist. VI, Rt. 18, Secs. A, I & J, McCray Co., Los Angeles, \$103,043; Kennedy Construction Co., Oakland, \$118,285; L. J. Lynch Construction Co., Piedmont, \$100,173; Robinson-Roberts Co., Los Angeles, \$112,895; L. W. Hesse, Merced, \$142,768; Contoules Construction Co., San Francisco, \$99,101; Triangle Rock and Gravel Co., San Bernardino, \$94,703; Gist & Bell, Arcadia, \$125,280. Contract awarded to Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$91,311.

MONTEREY COUNTY—Reinforced concrete bridge across Granite Creek, about 14 miles south of Monterey. One 12' open spandrel arch span, two girder spans, each 14'; two girder spans, each 20'; two girder spans, each 20'. Dist. V, Rt. 56, Sec. H, Gutleben Bros., Oakland, \$35,146; Bodenhamer Construction Co., Oakland, \$40,179; Rocca & Calelli, San Rafael, \$40,387; R. B. McKenzie, Red Bluff, \$42,000; M. B. McGowan, San Francisco, \$40,446; Fred J. Maurer & Son, Inc., Eureka, \$39,677; Oberg Bros., Los Angeles, \$35,970; Hanrahan Co., San Francisco, \$35,308. Contract awarded to George J. Ulrich Construction Co., Modesto, \$33,705.

NEVADA COUNTY—Between westerly boundary and Toll House. About 2.5 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. III, Rt. 15, Sec. A, Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$114,487; Force Construction Co., Piedmont, \$97,487; Frank C. Cuffe, San Rafael, \$63,027; Kennedy Construction Co., Oakland, \$95,987. Contract awarded to Hemstreet & Bell, Marysville, \$90,762.

PLACER COUNTY—Between Colfax and Gold Run. About 9.1 miles to be surfaced with bituminous treated crushed gravel or stone (plant mixed). Dist. II, Rt. 37, Secs. B & C, Healy, Tibbitts Construction Co., San Francisco, \$101,310; Clark & Henry Construction Co., San Francisco, \$109,740; Hemstreet & Bell, Marysville, \$117,234; W. H. Hauser, Oakland, \$115,308; A. Teichert & Son, Inc., Sacramento, \$127,033. Contract awarded to Southwest Paving Co., Los Angeles, \$90,675.

RIVERSIDE COUNTY—Widen existing multiple span arch bridge across Santa Ana River near Riverside. Two 95'-0" spans, two 102'-0" and one 106'-0" spans on concrete piers and abutments with pile foundations. Dist. VIII, Rt. 19, Sec. A, Bodenhamer Construction Co., Oakland, \$120,920; Merritt, Chapman & Scott, San Pedro, \$133,031; R. H. Travers, Los Angeles, \$150,928; Matich Bros., Elsinore, \$116,096; Robinson, Roberts Co., Los Angeles, \$125,603; Oberg Bros., Los Angeles, \$116,683; Owl Truck Co., Inc., Compton, \$132,474; L. J. Lynch Cannon Engineering Co., Los Angeles, \$128,649. Contract awarded to Byerts & Dunn, Los Angeles, \$105,865.

SAN BERNARDINO COUNTY—Between 6 miles west of Baker and Halloran Summit. About 23.7 miles to be graded and surfaced with oil treated crushed gravel or stone. Dist. VIII, Rt. 31, Secs. K, L, M, Peninsula Paving Co., San Francisco, \$419,488; Gibbons & Reed Co., Burbank, \$445,955; Lane Transportation Co., Los Angeles, \$444,007; Southwest Paving Co., Los Angeles, \$423,902; Healy, Tibbitts Construction Co., San Francisco, \$462,749; Chas. U. Heuser, Glendale, \$410,065; George Herz & Co., San Bernardino, \$390,840; New Mexico Construction Co., Inc., Albuquerque, New Mexico, \$462,029; Morrison-Knudsen Co., Idaho, \$395,086; McCray Co., Los Angeles, \$466,231; Ishell Construction Co., Carson City, Nevada, \$494,478. Contract awarded to H. W. Rohl Co., Los Angeles, \$363,869.

SAN BERNARDINO COUNTY—Between Anderson St. and city limits of Redlands. About 3.48 miles. Fuel oil to be applied to the shoulders. Dist. VIII, Rt. 26,

National Analysis Shows Latest Auto Laws Vary in U. S.

ANATION-WIDE analysis of motor vehicle laws, including those passed at recent sessions of legislatures in forty-four states, should prove of intense interest to autoists and pedestrians as well.

Speed laws vary all the way from fifty miles an hour in North Dakota to the twenty-five mile prima facie limit in Missouri. Fourteen states, namely, Connecticut, Florida, Indiana, Iowa, Kansas, Maine, Michigan, Montana, Nevada, Oregon, Tennessee, Vermont, Wisconsin and Wyoming, have discarded the fixed speed limit and stipulate a rate of speed that is "reasonable and proper" in view of traffic conditions or that permits stopping within "the clear distance ahead."

RIGHT OF WAY

Concerning right of way, in general, vehicles approaching from the right have priority. Idaho, however, gives the right of way to cars on state highways.

Overtaking on hills or curves where view is obstructed is specifically prohibited in thirty-three states and the District of Columbia. In many states, no other act of carelessness brings more prompt action from state highway police.

STOP AT TRACKS

Ten states, namely, Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Louisiana, Mississippi, Pennsylvania and Tennessee, require a full stop before crossing railroad tracks, while six additional states and the District of Columbia require a full stop without special stop signs are erected.

Parking on the main traveled portion of the highway is a violation of the state code in a majority of cases, while in states where such parking is not definitely prohibited, it is required that fifteen feet of roadway be left clear.

MUST DIM LIGHTS

Regarding lighting, the law of fifteen states, namely, Arizona, Arkansas, Colorado, Florida, Illinois, Indiana, Kansas, Michigan, Montana, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio and Oregon, requires that lights be dimmed when approaching vehicles. Oregon requires dimming of lights on wet pavements. Spotlights are prohibited in Kansas, North Carolina, Oklahoma, Wisconsin and in the cities of Missouri.

ROADS RULE THE WORLD; PRIESTS OF PROSPERITY

Good highways have been subject matter of many eulogies in the form of speeches, articles, engineers' reports, and books, but the finest and most concise tribute noted recently is credited to an Englishman whose name is unknown. He says:

Roads rule the world—not kings, nor courts, nor constables; not ships, nor soldiers. The road is the only royal line in a democracy, the only legislature that never changes, the only court that never sleeps, the only army that never quits, the first aid to the redemption of any nation, the exodus from stagnation in any society, the call from savagery in any tribe, the high priest of prosperity after the order of Melchisedec, without beginning of days or end of life.

The road is umpire in every war, and when the map is made it simply pushes on its great campaign of help, hope, brotherhood, efficiency and peace.

HIGHWAY BIDS AND AWARDS

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Sec. A, Square Oil Co., Los Angeles, \$956; California Road Oil Service Co., Wilmington, \$1,034; Pacific Tank Lines, Inc., Los Angeles, \$1,050; Gilmore Oil Co., Ltd., Los Angeles, \$1,159; California Crane Service, Los Angeles, \$1,167. Contract awarded to The Petrol Corporation, Los Angeles, \$906.

SAN DIEGO COUNTY—Between La Mesa and La Posta Creek. About 33.9 miles. Furnish and apply heavy fuel oil on each side of existing pavement. Dist. VII, Rt. 12, Secs. A, B, C, D & F, Oilfields Trucking Co., Ltd., Taft, \$18,297; Gilmore Oil Co., Ltd., Los Angeles, \$16,964; Pacific Tank Lines, Inc., Los Angeles, \$13,149. Contract awarded to Square Oil Co., Inc., Los Angeles, \$10,297.

SAN JOAQUIN COUNTY—About 0.3 miles near Ripon to be graded and paved with Portland cement concrete. Dist. X, Rt. 4, Sec. A, Pacific Construction Co., Oakland, \$12,975. Contract awarded to N. M. Ball, Porterville, \$10,922.

SANTA CLARA COUNTY—Between Coyote Creek and San Jose. About 1.4 miles long to be graded and paved with Portland cement concrete and asphalt concrete. Dist. IV, Rt. 5, Sec. A, Valley Paving and Construction Co., Fresno, \$62,679; Transula Paving Co., San Francisco, \$71,637; A. J. Raisen, San Jose, \$79,041. Contract awarded to Union Paving Co., San Francisco, \$62,426.

SANTA CLARA COUNTY—Reinforce concrete girder bridge across Coyote Creek at San Jose. Consists of 6 spans 34' long on concrete pile bents and concrete abutments and wing walls on pile foundations. Dist. IV, Rt. 5, Sec. A, Bodenhamer Construction Co., Oakland, \$37,178; Oberg Bros., Los Angeles, \$36,291; Healy, Tibbitts Construction Co., San Francisco, \$39,284; M. B. McGowan, San Francisco, \$38,214; A. W. Kitchen, San Francisco, \$37,181; Neves & Harp, Santa Clara, \$32,977; Rocca & Calletti, San Rafael, \$41,798; Peter McHugh, San Francisco, \$37,795; John Doyle, San Jose, \$38,963. Contract awarded to A. J. Raisen, San Jose, \$31,271.

SHASTA COUNTY—Across Seamans Gulch, about 23 miles east of Redding. 22 19' spans on frame bents with concrete pedestals. Dist. II, Rt. 28, Sec. A, Rolla Arbuckle, Anderson, \$21,402; J. P. Brennan, Redding, \$21,955; R. B. McKenzie, Red Bluff, \$19,378; Fred J. Maurer & Son, Inc., Eureka, \$20,773; John Berlinger, Orland, \$16,531; J. W. Hoopes, Sacramento, \$20,646; R. B. Boyd, San Diego, \$21,505; M. A. Jenkins, Sacramento, \$20,596. Contract awarded to Rufus J. Bean, Clipper Mills, \$15,358.

STUTTER COUNTY—Near the County Hospital. 0.3 miles to be graded and paved with asphalt concrete. Dist. III, Rt. 3, Sec. A, Hemstreet & Bell, Marysville, \$7,584. Contract awarded to Jones & Kin, Hayward, \$6,247.

July Water Applications and Permits

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of July, 1931.

HUMBOLDT AND TRINITY COUNTIES—Permit 3740, Application 6560. Trinity Loop Mining Company, Berkeley, Calif., July 7, 1931, for 150 c.f.s. from ten creeks in Secs. 22, 28, 27 and 34, T. 7 N., R. 6 E., H. B. M., and Secs. 4 and 9, T. 6 N., R. 6 E., H. B. M., for mining and domestic purposes. Estimated cost \$150,000.

LOS ANGELES COUNTY—Permit 3741, Application 6907. U. S. Angeles National Forest, Los Angeles, Calif., July 13, 1931, for 1300 gallons per day from Camp Spring in Sec. 13, T. 7 N., R. 16 W., S. B. M., for domestic purposes. Estimated cost \$100.

LOS ANGELES COUNTY—Permit 3742, Application 6908. U. S. Angeles National Forest, Los Angeles, Calif., July 13, 1931, for 1300 gallons per day from Ranger Spring in Sec. 18, T. 7 N., R. 15 W., S. B. M., for domestic purposes. Estimated cost \$50.

SAN DIEGO COUNTY—Permit 3743, Application 6928. V. I. Edwards, San Diego, Calif., July 13, 1931, for 0.25 c.f.s. from Beaver Creek in Sec. 25, T. 16 S., R. 1 E., S. B. M., for irrigation and domestic purposes. Estimated cost \$1,000.

MODOC COUNTY—Permit 3744, Application 6858. Thomas A. Somma, Canby, Calif., July 14, 1931, for 13,000 gallons per day from an unnamed stream in Sec. 9, T. 41 N., R. 9 E., M. D. M., for irrigation and domestic purposes.

MONO COUNTY—Permit 3745, Application 6773. Alice F. Hunewill, Bridgeport, Calif., July 16, 1931, for 200 gallons per day from an unnamed stream in Sec. 5, T. 3 N., R. 24 E., M. D. M., for domestic purposes. Estimated cost \$150.

EL DORADO COUNTY—Permit 3746, Application 6801. Frank L. Montague et al., Antioch, Calif., July 16, 1931, for 600 gallons per day from an unnamed spring in Sec. 29, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$30.

MONTEREY COUNTY—Permit 3747, Application 6837. Henrietta T. Austin, Salinas, Calif., July 17, 1931, for .075 c.f.s. from an unnamed stream in Sec. 2, T. 17 S., R. 2 E., M. D. M., for irrigation and domestic use on four acres.

TRINITY COUNTY—Permit 3748, Application 6788. Charles H. Miller, Chico, Calif., July 17, 1931, for 1500 gallons per day from an unnamed spring in Sec. 19, T. 1 S., R. 8 E., H. B. M., for domestic purposes. Estimated cost \$600.

TUOLUMNE COUNTY—Permit 3749, Application 6799. Oakland-Piedmont Council, Boy Scouts, Oakland, Calif., July 17, 1931, for 15,000 gallons per day from Middle Fork of Tuolumne River in Sec. 15, T. 1 S., R. 19 E., M. D. M., for domestic purposes. Estimated cost \$1,500.

SAN JOAQUIN COUNTY—Permit 3750, Application 6612. F. J. Dietrich et al., Stockton, Calif., July 21, 1931, for 1.44 c.f.s. from Calaveras River in Sec. 5, T. 2 N., R. 9 E., M. D. M., for irrigation use on 115.46 acres.

SAN JOAQUIN COUNTY—Permit 3751, Application 6623. L. F. Grimsley et al., Stockton, Calif., July 21, 1931, for 2.56 c.f.s. from Calaveras River in Sec. 4, T. 2 N., R. 9 E., M. D. M., for irrigation use on 204.69 acres.

SAN JOAQUIN COUNTY—Permit 3752, Application 6624. Ray and T. C. H. McGurk, Stockton, Calif., July 21, 1931, for 2.94 c.f.s. from Calaveras River in Section 33, T. 3 N., R. 9 E., M. D. M., for irrigation use on 223 acres. Estimated cost \$3,000.

MONO COUNTY—Permit 3753, Application 6883. O. P. Dyar, Pasadena, Calif., July 21, 1931, for 150 gallons per day from an unnamed stream in Sec. 17, T. 4 S., R. 27 E., M. D. M., for domestic purposes. Estimated cost \$50.

EL DORADO COUNTY—Permit 3754, Application 6898. United States El Dorado National Forest, Placerville, Calif., July 30, 1931, for 800 gallons per day from an unnamed spring in Sec. 21, T. 13 N., R. 17 E., M. D. M., for domestic and fire protection purposes. Estimated cost \$100.

EL DORADO COUNTY—Permit 3755, Application 6899. United States El Dorado National Forest, Placerville, Calif., July 30, 1931, for 800 gallons per day from Doane Springs in Sec. 2, T. 11 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$150.

EL DORADO COUNTY—Permit 3756, Application 6900. United States El Dorado National Forest, Placerville, Calif., July 30, 1931, for 3200 gallons per day from Bryant Creek in Sec. 15, T. 11 N., R. 17 E., M. D. M., for domestic and fire protection purposes. Estimated cost \$500.

EL DORADO COUNTY—Permit 3757, Application 6903. United States El Dorado National Forest, Placerville, Calif., July 30, 1931, for 3000 gallons per day from Granite Lake Creek in Sec. 28, T. 13 N., R. 17 E., M. D. M., for domestic and fire protection purposes. Estimated cost \$450.

HUMBOLDT COUNTY—Permit 3758, Application 6796. Division of Highways, Sacramento, Calif., July 30, 1931, for 970 gallons per day from an unnamed spring in Sec. 28, T. 2 S., R. 3 E., H. B. M., for recreational purposes. Estimated cost \$250.

PLUMAS COUNTY—Permit 3759, Application 6950. C. E. McGrath and R. L. Morgan, Greenville, Calif., July 31, 1931, for 2 c.f.s. from Echo Creek in Sec. 35, T. 26 N., R. 8 E., M. D. M., for mining and domestic purposes.

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of July, 1931.

SAN DIEGO COUNTY—Application 6959. Hector Abdelnour, Spring Valley, Calif., for 900 gallons per day from an unnamed spring tributary to Cottonwood Creek watershed. To be diverted in Sec. 1, T. 17 S., R. 2 E., S. B. B. and M., for domestic purposes.

MONTEREY COUNTY—Application 6990. John C. Evans, San Simeon, Calif., for 0.02 c.f.s. from an unnamed spring tributary to Pacific Ocean. To be diverted in Sec. 5, T. 24 S., R. 5 E., M. D. B. and M., for domestic purposes.

MONTEREY COUNTY—Application 6991. John C. Evans, San Simeon, Calif., for 0.01 c.f.s. from an unnamed spring tributary to Pacific Ocean. To be diverted in Sec. 32, T. 23 S., R. 5 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

EL DORADO COUNTY—Application 6992. E. S. Wilson, A. V. Wilde, Don Atterbury, Mary McMahon, V. J. Sincok, A. M. Cleghorn, R. M. Belby and A. J. Deller, c/o E. S. Wilson, Box 512, Davis, Calif., for 1500 gallons per day from Rocky Canyon tributary to South Fork of American River. To be diverted in Sec. 18, T. 11 N., R. 17 E., M. D. B. and M., for domestic purposes.

LOS ANGELES COUNTY—Application 6993. James H. Robert, 1357 W. 38th Pl., Los Angeles, Calif., for 0.05 c.f.s. and 5 ac. ft. per annum from Dume Creek tributary to Pacific Ocean. To be diverted in Sec. 13, T. 1 S., R. 19 W., S. B. B. and M., for domestic purposes. Estimated cost \$1,500.

MONO COUNTY—Application 6994. R. W. Brown, Box 402, Oceanside, Calif., for 150 gallons per day from Rock Creek tributary to Owens River. To be diverted in Sec. 32, T. 4 S., R. 30 E., M. D. B. and M., for domestic purposes. Estimated cost \$100.

MONTEREY COUNTY—Application 6995. E. J. and Gertrude Bowles, 1127 Broad St., San Luis Obispo, Calif., for 200 ac. ft. per annum from an unnamed spring tributary to Pacific Ocean. To be diverted in Sec. 32, T. 23 S., R. 5 E., M. D. B. and M., for domestic purposes. Estimated cost \$150.

PLUMAS COUNTY—Application 6996. William Rutherford, R. F. Gilbride, E. A. Murray, Dewey Baker, C. E. Wotten, J. L. Britano, L. E. Barr and H. P. Frye, c/o William Rutherford, P. O. Box 288, Sacramento, Calif., for 0.1 c.f.s. and 9 ac. ft. per annum from an unnamed stream tributary to Willow Creek, thence Middle Fork of Feather River. To be diverted in Sec. 15, T. 23 N., R. 7 E., M. D. B. and M., for mining and domestic purposes.

EL DORADO COUNTY—Application 6997. W. H. Welch, Kyburz (forward to Twin Bridges, c/o Spen-

Applications and Permits Granted

(Continued from Preceding Page)

cer's Store), Calif., for 8 c.f.s. from Pyramid Creek tributary to South Fork of American River. To be diverted in Sec. 8, T. 11 N., R. 17 E., M. D. B. and M., for power and domestic purposes (9 h.p.). Estimated cost \$100.

CALAVERAS COUNTY—Application 6998. Giacomo Oneto, c/o Charles P. Snyder, Atty., San Andreas, for 0.05 c.f.s. from an unnamed spring tributary to North Fork of Tuolumne River. To be diverted in Sec. 23, T. 7 N., R. 17 E., M. D. B. and M., for domestic purposes.

EL DORADO COUNTY—Application 6999. R. P. Easley, 509 G St., Antioch, Calif., for 1200 gallons per day from a stream tributary to South Fork American River. To be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes.

INYO COUNTY—Application 7000. E. Hague and M. A. Stieger, Box 444, Trona, Calif., for 1 miner's inch from Redlands Spring. To be diverted in Sec. 18, T. 23 S., R. 45 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$2,000.

SIERIA COUNTY—Application 7001. John J. Connell, c/o R. F. Taylor, Downieville, Calif., for 0.1 c.f.s. from Swansea Tunnel tributary to Swansea Ravine and Middle Fork Yuba River. To be diverted in Sec. 3, T. 18 N., R. 10 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$200.

SAN DIEGO COUNTY—Application 7002. South Coast Land Company, a Corporation, c/o George O. Bauwens, Engineer, 412 Pacific Southwest Building, Long Beach, Calif., for 0.75 c.f.s. and 8 ac. ft. per annum from unnamed creek (sometimes called Fry Creek) tributary to San Luis Rey River. To be diverted in Sec. 22, T. 9 S., R. 1 W., S. B. B. and M., for irrigation and domestic purposes (63 acres). Estimated cost \$500.

PLUMAS COUNTY—Application 7003. J. B. Higgins, Quincy, Calif., for 8 c.f.s. from Blackhawk Creek tributary to Spanish Creek, thence Indian Creek and North Fork of Feather River. To be diverted in Sec. 27, T. 25 N., R. 9 E., M. D. B. and M., for mining purposes. Estimated cost \$1,000.

SISKIYOU COUNTY—Application 7004. Carl-David Mining Company, a Corporation, c/o Tebbe & Tebbe, Attns., Yreka, Calif., for 40 c.f.s. from Jaynes Canyon Creek, Uncle Tom's Cabin Creek, Rock Gulch and Deep Gulch tributary to West Fork of Beaver Creek. To be diverted in Sec. 5, T. 47 N., R. 9 W., M. D. B. and M., for power and domestic purposes (4545 h.p.).

SAN MATEO COUNTY—Application 7005. Humphrey Estates, Inc., 315 Montgomery St., San Francisco, Calif., for 195 c.f.s. per annum from Green Oaks Creek tributary to Pacific Ocean. To be diverted in Sec. 20, T. 9 S., R. 4 W., M. D. B. and M., for irrigation and stock watering purposes (475 acres). Estimated cost \$2,000.

SONOMA COUNTY—Application 7006. Hacienda, Inc. Hilton, Calif., for (1) 0.037, (2) 0.07, (3) 0.24 c.f.s. and (2) 40,000 gallons per annum from (1) unnamed stream (2) unnamed stream and (3) Russian River tributary to (1) and (2) Russian River and (3) Pacific Ocean. To be diverted in Sec. 1, T. 8 N., R. 10 W., M. D. B. and M., for irrigation and domestic purposes (19 acres).

TRINITY COUNTY—Application 7007. C. L. Brown, 600 S. Madison St., Pasadena, Calif., for 100 c.f.s. from Canyon Creek tributary to Trinity River, thence Klamath River. To be diverted in Sec. 17, T. 35 N., R. 10 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$150,000.

LOS ANGELES COUNTY—Application 7008. Charles P. Cooke, 1120 Las Palmas Ave., Los Angeles, Calif., for 1 c.f.s. from Piru Creek tributary to Santa Clara River. To be diverted in Sec. 13, T. 6 N., R. 18 W., S. B. B. and M., for industrial purposes (road construction). Estimated cost \$15,000.

SISKIYOU COUNTY—Application 7009. H. J. Barton, Box 517, Yreka, Calif., for (1) 5.0 (2) 8.75 and (3) 1.87 c.f.s. from (1) Jackson Creek, (2) South Fork Scott Creek and (3) Blue Jay Creek tributary to Scott Creek. To be diverted in Sec. (1) 10, T. 39 N., R. 9 W., M. D. B. and M., and Sec. (2) and (3) 34,

T. 40 N., R. 9 W., M. D. B. and M., for mining and domestic purposes.

SAN BERNARDINO COUNTY—Application 7010. H. C. Zech, 116 E. 31st St., Los Angeles, Calif., for 0.025 c.f.s. from unnamed spring tributary to Big Valley Drainage Area. To be diverted in Sec. 31, T. 2 N., R. 2 E., S. B. B. and M., for domestic purposes. Estimated cost \$2,500.

SHASTA COUNTY—Application 7011. State of California, Department of Public Works, Division of Highways, c/o C. H. Purcell, State Highway Engineer, Public Works Bldg., Sacramento, Calif., for 0.025 c.f.s. from unnamed spring tributary to Spring Creek, thence Clear Creek and Sacramento River. To be diverted in Sec. 23, T. 32 N., R. 6 W., M. D. B. and M., for domestic purposes.

MERCED COUNTY—Application 7012. East Side Canal and Irrigation Company, a Corporation, 315 Chancery Bldg., San Francisco, Calif., for 175 c.f.s. from McCoys Spillway, Arena Spillway, Livingston Drain (N. S. and main drain), Bear Creek, Owens Creek, Duck Creek and Deadman Creek tributary to San Joaquin River. To be diverted in Secs. 20, 21, 22, 27 and 30, T. 7 S., R. 11 E., M. D. B. and M.; Sec. 12, T. 8 S., R. 11 E., M. D. B. and M.; and Secs 19 and 30, T. 8 S., R. 12 E., M. D. B. and M., for irrigation purposes (49,503.74 acres).

EL DORADO COUNTY—Application 7013. Frank J. Murray and Edw. J. Schoenbacher, c/o Frank J. Murray, 640 36th St., Sacramento, Calif., for 200 gallons per day from Bull Creek tributary to South Fork of American River. To be diverted in Sec. 29, T. 11 N., R. 14 E., M. D. B. and M., for domestic purposes.

INYO COUNTY—Application 7014. John Amick, Independence, Calif., for 0.5 c.f.s. from Barrel Springs tributary to Mazourka Canyon, thence Owens River. To be diverted in Sec. 20, T. 12 S., R. 36 E., M. D. B. & M., for mining purposes. Estimated cost \$800.

KERN COUNTY—Application 7015. Board of Supervisors of Kern County, Bakersfield, Calif., for 0.40 c.f.s. from 2 springs. To be diverted in Sec. 29, T. 25 S., R. 22 E., M. D. B. and M., for domestic purposes.

HUMBOLDT COUNTY—Application 7016. Harry Pinkerton, 934 3d St., Eureka, Calif., for 0.02 c.f.s. from an unnamed stream tributary to Humboldt Bay. To be diverted in Sec. 20, T. 5 N., R. 1 E., H. B. and M., for domestic purposes. Estimated cost \$800.

MENDOCINO COUNTY—Application 7017. Frieda Farnett, Box 2, Gualala, Calif., for 100 gallons per day from Sea Side stream tributary to Pacific Ocean. To be diverted in Sec. 21, T. 11 N., R. 15 W., M. D. B. and M., for domestic purposes. Estimated cost \$500.

EL DORADO COUNTY—Application 7018. Mrs. B. M. Fountain, 2501 I St., Sacramento, Calif., for 400 gallons per day from an unnamed stream and spring tributary to South Fork of American River. To be diverted in Sec. 23, T. 11 N., R. 15 E., M. D. B. and M., for domestic purposes. Estimated cost \$50.

EL DORADO COUNTY—Application 7019. E. R. Hickey, G. L. Davenport and L. J. Caldwell, c/o E. R. Hickey, 609 3d St., Woodland, Calif., for 600 gallons per day from an unnamed stream tributary to South Fork of American River. To be diverted in Sec. 19, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$75.

SAN BERNARDINO COUNTY—Application 7020. Henry W. Muhleisen, 401 W. P. Story Bldg., Los Angeles, Calif., for 0.007 c.f.s. from water developed in tunnel. To be diverted in Sec. 28, T. 8 N., R. 18 E., S. B. B. and M., for mining and domestic purposes. Estimated cost \$500.

SAN DIEGO COUNTY—Application 7021. Karl Feller, Azusa, Calif., for 0.02 c.f.s. from unnamed spring tributary to Temecula River. To be diverted in Sec. 12, T. 9 S., R. 1 E., S. B. B. and M., for irrigation and domestic purposes (50 acres). Estimated cost \$250.

FRESNO COUNTY—Application 7022. County of Fresno, c/o Board of Supervisors, Fresno, Calif., for 0.11 c.f.s. from San Joaquin River tributary to Suisun Bay. To be diverted in Sec. 22, T. 9 S., R. 22 E., M. D. B. & M., for domestic purposes (tubercular sanatorium purposes). Estimated cost \$14,000.

STATE OF CALIFORNIA

Department of Public Works

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C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

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General Headquarters, Public Works Building,
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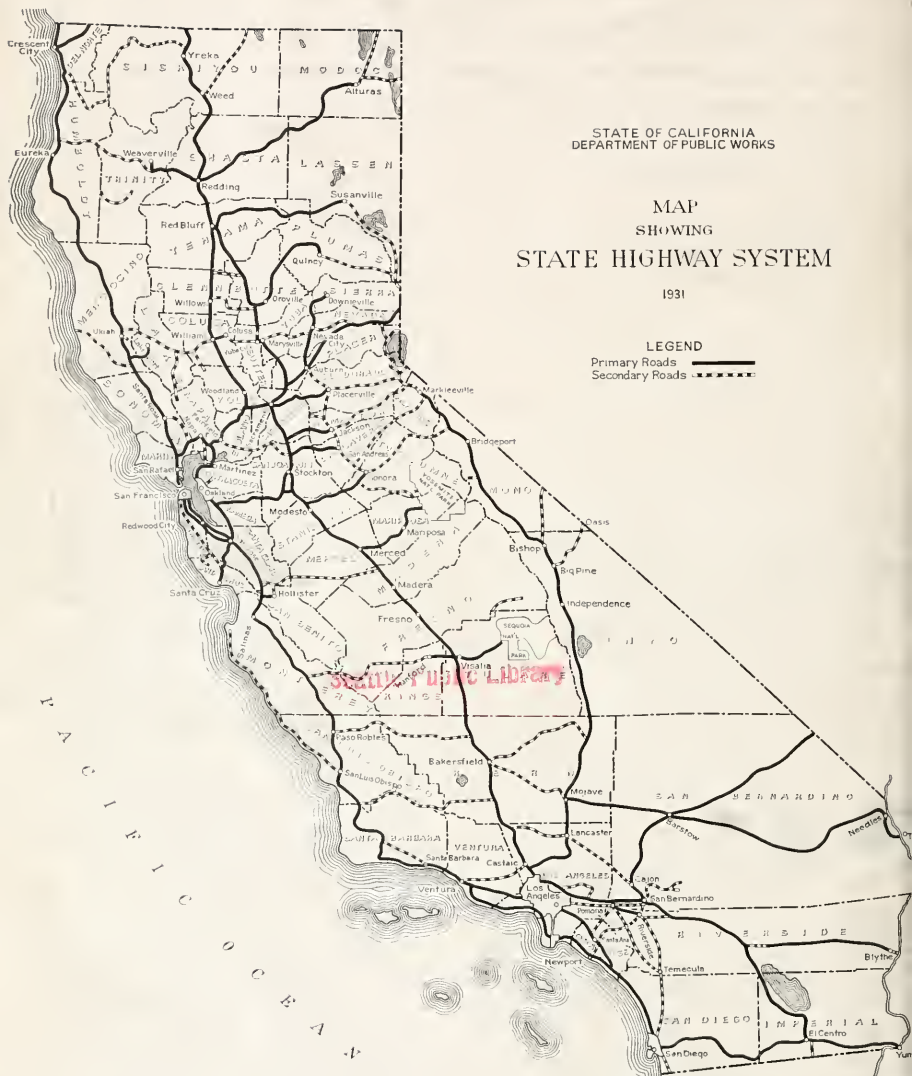
C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample



Semiannual Traffic Count on California State Highways, Taken July 12 and 13

(Addendum to California Highways and Public Works—August Issue, 1931)

By T. H. DENNIS, Maintenance Engineer

THE semiannual traffic count of the Division of Highways was taken July 12th and 13th between the hours of 6 a.m. and 10 p.m. each day throughout the State highway system. For purposes of analysis, the vehicles are segregated by hourly periods under the following classifications: California automobiles, foreign automobiles, light trucks, heavy trucks, trailers, buses and horse-drawn vehicles.

A comparison of the July, 1931, count with that of the same month a year ago, shows a decrease for all routes of 5.6 per cent on Sunday and 0.6 per cent on Monday. On the other hand the gasoline tax for comparable periods of 1930 and 1931 shows increased consumption approximating 6 per cent. This paradox may be explained by the gas war which prevailed during the spring months but which ended before the census was taken.

Of the 67 routes, 31 showed a gain on Sunday and 36 a loss. For the Monday count 40 routes gained and 27 lost.

The interstate connections were the only group to show a gain on both Sunday and Monday.

	Per cent gain-loss		No. Routes, gain-loss			
	Sunday	Monday	Gain	Loss	Gain	Loss
Main north and south routes.....	-8.1	+0.4	3	5	5	3
Laterals between inland and coast.....	-5.5	-2.5	12	19	18	13
Interstate connections.....	+3.1	+10.6	9	3	11	1
Recreational routes.....	-11.7	-19.2	7	9	6	10
Average, all routes.....	-5.6	-0.6	31	36	40	27

Gain or loss in traffic volume expressed as a percentage of the July, 1930, count for all State highway routes, is as follows:

Route	Per cent gain or loss			
	Sunday	Monday	Gain	Loss
1. Sausalito-Oregon Line.....	8.8	8.4		
2. San Francisco-San Diego.....	7.3	4.9		
3. Sacramento-Oregon Line.....	3.2	0.2		
4. Sacramento-Los Angeles.....	9.5	2.2		
5. Stockton-Santa Cruz.....	3.4	9.0		
6. Sacramento-Woodland Junction.....	25.6	18.4		
7. Tehama Junction-Bescia.....	14.9	9.1		
8. Ignacio-Cordella.....	11.8	4.5		
9. San Fernando-San Bernardino.....	3.8	5.0		
10. San Lucas-Sequoia National Park.....	10.4	5.9		
11. Sacramento-Riverton.....	7.1	13.0		
12. San Diego-El Centro.....	1.2	0.3		
13. Salda-Sonora.....	18.4	1.0		
14. Albany-Martinez.....	9.2	4.3		
15. Rt. 1, near Campella-Grass Valley.....	14.1	18.9		

Route	1931 Per cent gain or loss			
	Sunday	Monday	Gain	Loss
16. Hopland-Lakeport.....	16.4	17.7		
17. Roseville-Nevada City.....	4.9	16.5		
18. Merced-El Portal.....	22.9	8.7		
19. Rt. 9, W. of Claremont-Riverside.....	0.5	6.6		
20. Redding to Rt. 1 near Arcata.....	8.6	10.4		
21. Rt. 3, near Richvale-Quincy.....	1.8	9.4		
22. San Juan Bautista-Rt. 32.....	19.6	18.6		
23. Sausalito-Holop.....	17.3	26.8		
24. Rt. 4 near Lodi to Valley Springs.....	8.7	9.2		
25. Nevada City-Downville.....	4.4	11.4		
26. San Bernardino-El Centro.....	4.1	8.4		
27. El Centro-Yuma.....	32.7	19.7		
28. Redding-Nevada Line.....	12.0	11.3		
29. Red Bluff-Nevada Line.....	9.2	0.6		
31. San Bernardino-Jean.....	1.8	2.7		
32. Rt. 4, near Calistoga-Rt. 2 at Gilroy.....	16.8	14.6		
33. Rt. 4, near Bakersfield-Paso Robles.....	12.4	15.3		
34. Rt. 4, near Arroyo-Pine Grove.....	27.1	30.5		
35. Peanut-Kuntz.....	31.8	2.8		
37. Auburn-Collax.....	57.0	51.4		
38. Meyers-Nevada Line.....	39.5	32.4		
39. Tahoe City-Nevada Line.....	19.9	21.0		
40. Rt. 13, near Montezuma-Rt. 23, Mono Lake.....	16.1	29.8		
41. West and East of Hume.....	28.4	57.4		
42. Saratoga Gap at Redwood Park Gate.....	57.5	69.7		
43. San Bernardino-Big Bear Lake.....	7.0	19.7		
44. Boulder Creek-Redwood Park.....	12.3	7.1		
45. Willows-Rt. 3, N. of Biggs.....	8.4	2.5		
46. Mt. 1, near Klamath River-Rt. 3, near Cray.....	16.0	14.5		
47. Orland-Chico.....	9.3	42.6		
48. McDonalds-Wendling.....	17.6	47.2		
49. Calistoga-Lower Lake.....	7.9	0.8		
51. Santa Rosa-Schellville.....	12.6	2.7		
52. Alto-Tiburon.....	20.4	13.8		
53. Fairfield-Lodi.....	15.4	8.3		
54. Near Michigan Bar-Central House.....	27.0	6.7		
55. San Francisco-Spring Valley Dam.....	21.9	61.9		
56. S. of Carmel Entry, of Carmel Valley and Big Sur roads.....	29.6	24.6		
57. Santa Maria-Bodfish.....	8.3	0.6		
58. Mojave-Topoc.....	5.4	3.5		
59. Lancaster-Baileys.....	6.4	23.8		
60. El Rio-San Juan Capistrano.....	12.7	27.5		
61. La Canada-Mt. Wilson Rd.....	11.2	11.3		
62. Big Pine-Oasis.....	32.3	65.4		
64. Mecca-Blythe.....	12.8	15.5		
65. Auburn-Sonora.....	11.5	1.6		
66. Manteca-Rt. 5, near Mossdale School.....	9.7	18.0		
67. Pajaro River-Rt. 2, near San Benito River Bridge.....	1.3	7.2		
68. San Francisco-Burlingame.....	17.1	23.8		
69. San Quentin Road.....	28.7	45.8		
70. Ukiah Junction, Route 1.....	7.7	17.7		
71. Crescent City-Oregon Line.....	27.1	29.9		

A comparison of traffic census for July, 1930, and 1931, in the count from 6 a.m. to 10 p.m. shows the following figures:

Route 1. Sausalito to Oregon Line District IV					
Station Location	July, 1930		July, 1931		
	Sun.	Mon.	Sun.	Mon.	
Sausalito to Ferry Building.....	13	14	89	92	
Sausalito-Hyde Street Ferry.....	11,930	4,761	11,827	5,250	
Hyde Street-Berkeley.....			5,095	3,280	
Belvedere Jr. Rt. 52 to Belvedere, S. on I.....	17,691	6,610	12,073	8,193	
E. on I.....	1,694	940	11,768	8,476	
N. on Corte Madera.....	17,869	6,666	3,210	1,864	

Station Location	July, 1930		July, 1931		Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Alto Jc. at Jc. Marin 1-C & Rt. 52,					Klamath Bridge	1,352	1,113		
S. on 1			11,748	6,433	Klamath, Jc. Rt. 46 to Klamath				
E. on 52			1,350	811	Glen,				
N. on 1			11,466	6,186	S. on 1				906 817
Calif. Park Y Jc. Rt. 1 & 69,					E. on 46				158 147
S. on 1			13,252	7,606	N. on 1				852 919
N. on 1			13,520	7,058	Crescent Cy. S.E. of Cy. at Jc. Rd.				
E. on 69			4,465	2,315	to Crescent Cy.,				
San Rafael N. of Cy. at Hill Top,	12,437	5,825	12,750	6,103	N. on 1	1,579	1,541	1,938	1,977
Ignacio, Jc. Rt. 1 and 8,					N. to C. C.	2,123	2,064	2,534	2,434
S. on 1			12,000	5,346	E. on 1	1,531	1,349	1,755	1,674
E. on 8			8,633	4,230	Hiochi Bridge, C.R. to Smith River,				
N. on 1			3,621	1,151	S. on 1				
Petaluma S. of Cy. Limits at Main,					W. on C.R.				
Yard	9,272	4,903	9,683	5,601	N. on 1				
Petaluma N. of Cy.	10,446	6,614	9,941	7,016	Patricks Creek			855	826
to Jc. at Jc. C.R. to Sebastopol,					Oregon Line	915	836		
to Jc. at Jc. C.R. to Sebastopol,									
S. on 1	8,710	4,402	8,141	4,674					
E. on C.R.	4,632	1,668	4,346	1,720					
N. on 1	4,265	3,027	3,612	3,188					
Santa Rosa S. of Cy. at Triangle									
Service Sta.	4,718	3,400	5,706	4,167					
Santa Rosa N. of Cy. at S. P. R. R.									
Xing	6,791	5,112	6,849	5,256					
Headburg S. of Cal. at N. W. P.									
R. R. Xing	4,577	3,531	5,113	3,721					
Lytton, Jc. C.R. to Callstoga,									
S. on 1			3,393	2,780					
E. on C.R.			2,627	2,195					
N. on 1			993	721					
Asst			2,514	2,047					
McCoy's Jc. C.R. to Preston,									
S. on 1	2,329	1,779							
E. on C.R.	427								
N. on 1	1,906	1,520							
McDonald at Jc. Rt. 48 to Boone-									
ville,									
S. on 1	2,018	1,676	2,203	1,901					
W. on 48	326	254	430	344					
N. on 1	1,706	1,424	1,791	1,557					
Hopland at Jc. Rt. 16 to Lakeport,									
S. on 1	2,159	1,792	1,993	1,898					
E. on 16	934	793	722	751					
N. on 1	3,025	2,501	2,714	2,622					
Ukiah S. of Cy. Lts. Jc. with Rt. 70,									
S. on 1	2,421	2,208	2,306	2,117					
E. on 70	921	1,079	992	1,271					
N. on 1	3,054	3,108	2,969	3,090					
Ukiah N. of Cy. Lts. Jc. Rt. 15 to									
Colusa,									
S. on 1	2,788	2,670	3,087	2,983					
E. on 15	1,112	862	1,037	877					
N. on 1	2,914	2,050	2,345	2,384					
District I					District V				
Willits N. of Cy. at Jc. C.R. to					San Juan Bautista N. of Cy. at Jc.				
Sherwood,					with Rt. 67 Chittenden Rd.,				
S. on 1	1,589	1,510	1,881	1,778	N. on 2	5,972	5,667	5,617	3,775
W. on C.R.	62	76	50	85	N. on 67	3,861	1,623	3,811	1,740
N. on 1	1,532	1,437	1,837	1,697	S. on 2	5,507	3,370	5,062	3,436
Mendocino-Hum. Co. Line	1,245	1,174	1,342	1,300	San Juan Bautista S. of Cy. at Jc.				
Garberville Jc. C.R. to Briceband,					with Rt. 22 to Hollister,				
S. on 1	1,908	1,687	2,048	1,913	N. on 2	4,912	3,498	4,961	3,624
W. on C.R.	319	186	377	291	E. on 22	3,581	2,113	3,160	2,145
N. on 1	2,092	1,808	2,057	1,964	N. on 2	4,540	3,048	4,363	3,081
Dyerville at Jc. C.R. to South Fork,					S. H. Mon. Co. Line	4,115	2,722	4,058	2,875
S. on 1	2,262	1,691	2,225	1,726	Salinas N. of Cy. Lts.	8,996	7,192	7,967	6,014
E. on C.R.	355	395	340	334	Salinas S. of Cy. Lts.	5,277	4,797	4,922	5,100
N. on 1	2,161	1,539	2,247	1,624	Gonzales 3 Mi. W. of Town	3,817	3,469	3,802	3,490
W. on C.R.	189	132	223	176	Soledad S. of Milk Plant	3,616	3,429		
Alton, Jc. C.R. to Red Bluff,					E. End of King City Bridge			3,583	3,140
S. on 1			2,749	2,021	San Lucas S. of Cy. at Jc. Rt. 10 to				
E. on C.R.			679	583	Coalinga and C.R. to Jolico				
N. on 1			2,979	2,170	N. on 2	2,732	2,510	2,666	2,252
Fernbridge at Jc. C.R. to Ferndale,					E. on 10	152	171	198	108
S. on 1	3,746	2,402	3,684	2,509	W. on C.R.	89	174	85	91
W. on C.R.	1,135	863	1,178	977	S. on 2	2,628	2,839	2,602	2,225
N. on 1	3,668	2,491	3,796	2,623	Paso Robles N. of Cy. Lts.	2,978	2,628	3,346	2,981
Eureka S. of Cy. Lts.	4,869	3,653	4,676	4,587	Paso Robles S. of Cy. Lts.	3,903	3,301	4,464	3,539
Eureka N. at Eureka Slough Bridge	4,400	3,109	4,464	3,576	San Luis Obispo N. of Cy. Lts.	4,235	3,853	3,955	3,147
Aranta N. of Cy. at Jc. Rt. 20 to					San Luis Obispo S. of Cy. Lts.				
Westerville,					R. H. Xing	6,159	4,676	6,768	4,867
S. on 1	4,050	2,385	3,889	2,650	N. of Pismo, Jct. Rt. 2 & Terrace				
E. on 20	1,438	688	1,611	799	Ave.				
N. on 1	2,554	1,744	2,601	1,899	N. on 2			6,505	4,444
Clam Beach, Jc. C.R. to Crannell,					W. on C.R.			2,614	884
S. on 1			2,145	1,452				4,599	3,566
E. on C.R.			447	311					
N. on 1			2,206	1,471					
Orick Jc. Rt. 1 & C.R. to Welch-									
pece,									
S. on 1	1,256	1,074	1,121	1,051					
E. on C.R.	81	64	41	38					
N. on 1	1,201	1,072	1,150	1,085					

	July, 1930		July, 1931			July, 1930		July, 1931	
Station Location	Sun. 13	Mon. 14	Sun. 12	Mon. 13	Station Location	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Harrison Sta. Jct. Rt. 2 & C.R. to Lompoc.					Jc. C.R. to Potosi N. of 12 Mi. House.				
W. on 2.....			3,385	2,983	N. on 3.....	6,335	4,032	6,136	4,591
S. on C.R.....			430	404	E. on C.R.....	724	397	755	390
E. on 2.....			2,998	2,696	N. on 3.....	5,686	3,655	5,733	4,221
1 MI. S. of Zaca Jc. Los Olivos Rd.,					Roseville S. of Cy. Lts.....	6,696	4,552	6,493	5,343
N. on 2.....	3,076	2,653	2,790	2,351	Roseville N. of Cy. Lts.....	1,857	1,500	1,641	1,526
E. on C.R.....	257	134	187	149	Linedale S. of City.....			1,731	1,648
S. on 2.....	2,972	2,615	2,716	2,283	Marysville S. of Cy. at Jc. Ham- monion Rd.,				
Buelton at Intersection with Co. Rds. W. to Lompoc and Easterly.					N. on 3.....	1,574	1,901	1,946	1,826
N. on 2.....	2,259	2,563	3,061	2,601	Hm. Rd.....	705	977	983	930
E. on C.R.....	421	434	683	578	N. on 3.....	2,691	3,594	3,251	3,265
W. on C.R.....	453	347	587	431	W. on C.R.....	860	1,080	781	938
S. on 2.....	2,491	2,767	3,194	2,826	Yuba Cy. N. of Cy. at Jc. Rt. 15, W. on 15.....	3,932	4,415	3,862	4,388
Gaviota W. of Rd. to Gaviota Sta. Orella, opposite Orella Sta.	3,280	2,563	3,209	2,633	N. on 3.....	2,225		2,166	
Stony Cr. 3 MI. N. of Goleta.....	3,450	2,608			N. on 3.....	2,693	2,829	2,364	2,751
Santa Barbara W. of Cy. at Jc. San Marcos Rd.,			1,612	3,706	Gridley, Jc. C.R. to Oroville, S. on 3.....			1,649	1,872
N. on 2.....	6,640	5,547	5,891	4,833	E. on C.R.....			1,603	1,136
On San Marcos Rd.,	1,220	441	1,040	582	N. on 3.....			1,856	1,940
S. on 2.....	7,449	5,764	6,502	5,179	Richvale Wye Jc. Rt. 21 to Oroville, W. on 3.....	1,339	1,147	1,286	1,092
Santa Barbara W. of Cy. Lts. on 2, Santa Barbara 300 Ft. E. of Cy Lts,	8,638	7,462	8,205	7,210	N. on 3.....	1,241	1,057	1,166	1,034
Carpinteria, Jct. Rt. 2 & Casitas Pass Rd.,					E. on 21.....	456	459	459	384
W. on 2.....			8,666	5,724	Chico at Jc. C.R. east to De Sabia, S. on 3.....	3,064	2,771	3,167	2,833
N. on C.R.....			411	468	N. on C.R.....	378	366	325	419
E. on 2.....			8,559	5,645	N. on 3.....	3,342	2,969	3,343	3,124
Santa Barbara-Ventura Co. Line.....	7,880	4,829			Chico N. of Cy. at Jc. C.R. East, S. on 3.....	2,433	2,317	1,889	1,691
District VII					E. on C.R.....	515	340	237	159
Ventura W. of Cy. at Bridge.....	10,365	6,097	9,494	5,838	N. on 3.....	2,069	2,106	1,786	1,635
Ventura E. of Cy. Lts.....	10,382	6,711	9,815	7,934	District II				
Ventura, E. of City, Jc. Telegraph Rd.,					Dutte-Tehama Co. Line.....	1,050	941		
E. on 2.....			9,915	7,634	Red Bluff at Jc. with Rt. 29 to Susanville,				
W. on 2.....			12,649	9,397	S. on 3.....	1,868	1,720	1,567	1,274
N. on C.R.....			3,074	2,354	E. on 29.....	987	820	976	725
Ei Rio Intersection,					N. on 3.....	2,051	1,989	1,943	1,813
W. on 2.....	9,351	5,847	8,697	5,994	Cottonwood S. of Town at Tehama Shasta Co. Line.....	2,117	1,812	2,084	2,102
N. to Statcoy.....	1,545	1,453	1,637	1,161	Redding S. of Cy. at Jc. Rt. 28 to Alturas,				
S. on 60.....	7,870	5,239	7,277	5,036	S. on 3.....	2,144	2,283	2,278	2,527
E. on 2.....	4,300	2,389	4,233	2,893	E. on 28.....	723	756	736	803
Ventura-Los Angeles Co. Line.....	4,907	1,979	4,904	2,267	N. on 3.....	2,713	2,910	2,660	2,856
Calabasas, Jc. Mulholland Dr.,					Redding 3 MI. N. at Jc. with C.R. to Kennett,				
E. on 2.....			6,737	3,295	S. on 3.....				
W. on 2.....			6,732	3,284	E. on 28.....	723	756	736	803
S. on C.R.....			342	202	N. on 3.....	2,713	2,910	2,660	2,856
W. of Hollywood-Ventura Blvd. at Seppelveda St.,	10,288	5,486	10,319	6,146	S. on 3.....	1,549	1,250	1,326	1,035
L. A. E. at Indiana St.,	16,851	14,352	14,262	14,510	W. on C.R.....	36	43	34	42
Whittier at Jc. with Hadley St.,					N. on 3.....	1,542	1,257	1,326	1,028
E. on 2.....	17,981	13,669	18,924	13,673	Gibson-Roulder Creek Maint. Yard.....	1,542	1,342	1,334	1,021
N. on Hadley.....	3,671	4,342	3,460	3,258	Dunsmuir 1.5 MI. S.....	2,137	1,785	2,119	1,578
E. on 2.....	12,644	10,045	14,319	10,599	Dunsmuir S. Cy. Lts. at Br.....	4,060	3,526	3,821	3,247
La Habra E. Cy. Lts. at Jc. Rds. to La Habra and Brea,					Dunsmuir 4 MI. N. at Mott.....	2,728	2,001	2,330	1,828
N. on 2.....	9,050	4,761	8,371	4,718	Gazelle 1 MI. N.....	1,417	1,242	1,600	1,281
W. to La Habra.....	4,190	3,364	4,089	3,423	Yreka, S. Cy. Lts.....	2,591	2,221	2,153	2,075
E. to Brea.....	3,052	2,128	2,925	2,038	Jc. with Rt. 46 S. of Hornbrook, S. on 3.....	1,838	1,382	1,504	1,286
S. on 2.....	16,314	5,469	16,393	5,494	W. on 46.....	356	276	273	221
Anaheim N. of Cy. Lts.....	13,947	9,465	14,063	10,493	N. on 2.....	1,587	1,341	1,436	1,290
N. of Jc. Santa Ana Blvd. & Chap- man St.,					Oregon Line.....	1,615	1,308	1,465	1,138
Santa Ana N. of Cy Lts. at Jc. C.R. to Orange,			17,640	11,287	Route 4. Sacramento to Los Angeles				
N. on 2.....	16,483	10,840	5,695	4,118	District X				
E. on C.R.....	9,354	6,810	8,250	6,825	Sacramento S. of City Lts.....	8,083	6,792	7,644	7,466
S. on 2.....	15,337	12,399	6,438	5,313	7 MI. House at Intersection Florin Rd.,				
Tustin W. of Cy.....	8,014	5,886	8,267	8,224	N. on 4.....	4,806	3,843	4,549	3,938
Serra Jc. Rt. 60,					E. on C.R.....	918	872	783	653
N. on 2.....	5,167	2,550	4,849	2,309	W. on C.R.....	92	105	91	112
W. on 60.....	7,577	3,802	7,273	3,636	S. on 4.....	4,568	3,418	4,139	3,605
S. on 2.....	10,936	5,687	10,138	5,110	Old Elk Grove at Intersection Franklin-Elk Grove Rd.,				
Oceanside Nr. S. Cy. Lts.....	9,297	5,499	10,183	5,769	N. on 4.....	4,266	2,986	3,747	3,138
Delmar at S. P. R. K. Xing.....	9,053	4,676	8,924	4,934	E. on C.R.....	663	720	703	754
Route 3. Sacramento to Oregon Line					W. on C.R.....	500	422	477	403
District III					S. on 4.....	3,789	2,542	3,324	2,695
Sacramento N. at Jc. Garden High- way,					Twin Cities Jc. Rt. 34 to Jackson, N. on 4.....	3,902	2,806	3,535	2,679
W. on 2.....	13,105	13,485	13,995	14,503	E. on 34.....	987	461	464	355
N. on Garden Highway.....	1,943	1,832	1,051	827	S. on 4.....	3,926	2,848	3,559	2,730
E. on 3.....	13,261	12,223	13,148	13,959	Jc. S. H. and C.R. to Stockton, N. on 4.....	3,759	2,394	3,332	2,558
Ben All Xing Jc. C.R.,					S. on 4.....	3,325	2,202	2,670	2,091
W. on 2.....	7,600	5,023	7,980	5,337	S.W. on C.R.....	437	206	292	496
N. on C.R.....	602	452	722	502	Loft Jc. Rt. 24 to San Andreas, N. on 4.....	3,573	3,213	3,605	3,394
S. on C.R.....	1,068	988	1,125	890	E. on 21.....	1,542	1,538	1,311	1,251
E. on 3.....	7,427	4,872	6,843	4,967	S. on 4.....	4,680	2,737		
Route 3. Sacramento to Oregon Line									

Station Location	July, 1930		July, 1931		Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Cherokee Station,					Intersection Brundage Lane and Rt. 4,				
N. on 4.....			3,464	3,061	N. on 4.....	4,582	4,993	4,185	4,179
E. on C.R.....			3,465	3,060	S. on 4.....	4,636	4,557	4,613	4,236
S. on 4.....			*	*	W. on B. L.....	910	810	827	865
Stockton S. of Cy. Jc. of Mariposa Rd.,					Bakersfield 6 Mi. S. of Jc. C.R. to Taft,				
W. on 4.....	3,516	2,530	*	*	N. on 4.....	3,466	2,981	3,929	3,774
E. on C.R.....	1,178	746	*	*	W. on C.R.....	681	568	1,025	696
S. on 4.....	2,363	1,794	*	*	S. on 4.....	3,224	2,812	3,784	3,488
Turner's Sta. Intersection of Rt. 4 and C.R.,					20 Mi. S. of Bakersfield at Jc. Rt. 57, Mariposa Road,				
N. on 4.....	2,228	1,715	*	*	N. on 4.....	2,509	2,034	2,615	2,189
S. on 4.....	3,112	2,444	*	*	W. on 57.....	325	169	310	247
W. on C.R.....	1,589	1,271	*	*	S. on 4.....	2,450	2,040	2,737	2,395
E. on C.R.....	542	390	*	*	Lebec N. of Station.....	2,864	2,258	3,061	2,469
Ripon N. of City.....	5,704	4,005	5,170	4,590					
Salida Jc. Rt. 13 to Sonora,									
N. on 4.....	6,077	4,392	5,848	4,667					
E. on 13.....	383	414	369	552					
S. on 4.....	6,141	4,563	5,547	5,021					
Modesto N. of City.....	7,777	6,762	7,602	7,312					
Modesto S. of Cy. Jc. Crow's Landing Rd.,									
N. on 4.....	10,543	9,367	10,505	10,285					
S. on 4.....	9,508	8,544	9,666	9,252					
W. on C.R.....	3,086	2,953	3,088	3,513					
Turlock N. of City.....	6,043	5,119	5,862	5,740					
Turlock S. of City.....	5,298	4,379	5,041	4,753					
* Under construction.									

District VI

Stanislaus-Mer. Co. Line	4,319	3,856	3,965	4,169
Atwater N. of Cy.	4,509	3,853	4,052	3,949
Merced N. of Cy. Lts. at Bridge	4,428	5,475	5,681	5,483
Merced S. Cy. Lts. at Bridge	4,382	3,816	3,862	4,077
Merced-Madera Co. Line	3,094	2,481	2,567	2,331
Califa Jc. Rt. 32 to Gilroy,				
N. on 4.....	3,998	2,833	2,748	2,451
W. on 32.....	618	716	906	782
S. on 4.....	3,998	2,914	3,557	3,061
Madera N. of City.....	4,548	3,528	4,199	3,641
Madera-Presno Co. Line	4,813	4,020	4,255	4,158
Muscatel.....	6,261	4,248	5,530	4,388
Presno N. of Cy. W. of S. P. R. R. Xing at Jc. Olive Ave.,				
N. on 4.....	7,467	5,746	6,441	5,779
E. on Olive.....	2,681	1,311	2,429	1,268
S. on 4.....	5,981	5,063	5,756	5,373
W. on Olive.....	2,790	1,151	2,029	985
Presno S. of Cy. at Jc. Church Ave. on 4.....	9,988	9,285	7,861	8,640
Malaga, S. of R. R. Sta.....	7,794	6,421	6,349	6,511
Fowler, S. of City.....	4,711	4,292	4,489	4,428
Selma, S. of City.....	4,827	4,595	3,868	3,588
Kingsburg, S. of City Nr. Kings River Bridge	4,149	3,114	3,626	3,192
Goshen Jc. Rt. 10 to Hanford and Visalia,				
N. on 4.....	3,320	2,925	2,994	2,745
W. on 10.....	1,542	1,184	1,235	1,137
S. on 4.....	3,038	2,544	2,812	2,529
E. on 4.....	1,950	1,807	1,698	1,616
Visalia Wye, Jc. Rt. 10 to Visalia,				
W. on 4.....	2,810	2,604	2,512	2,525
E. on 10.....	4,785	4,435	4,190	3,933
S. on C.R.....	2,616	2,025	2,126	1,612
Tulare S. of Cy. Lts.,				
E. on C.R.....	3,631	3,080	3,223	3,208
W. on C.R.....	328	359	310	436
S. on 4.....	3,588	2,991	3,284	3,039
Tipton at Intersection C.R. to Porterville,				
N. on 4.....	3,320	2,696	2,962	2,642
E. on C.R.....	328	275	278	247
S. on 4.....	3,242	2,537	2,929	2,608
Between Earlimart and Delano	3,199	2,702	2,949	2,732
Delano Intersection C.R. to Porterville,				
S. on 4.....	3,608	3,176	3,363	3,149
N. on 4.....	3,674	3,234	3,737	3,302
E. on C.R.....	937	518	517	464
Famosa Jc. Rt. 33 to Paso Robles,				
N. on 4.....	3,170	2,723	2,903	2,659
W. on 33.....	674	458	576	684
S. on 4.....	3,214	2,767	2,996	2,784
Nao at Saco Garage	3,581	3,079	3,359	3,399
Bakersfield N. of Cy. at Jc. C.R. to Oil Center,				
W. on 4.....	6,077	4,645	5,321	6,965
N. on C.R.....	6,408	6,418	4,422	6,068
S. on 4.....	8,918	9,206	9,426	10,049

Route 5. Stockton to Santa Cruz via Oakland

District X

French Camp,				
N. on 4.....	4,096	2,931		
S.W. on 5.....	3,291	2,456		
S.E. on C.R.....	726	536		
Jc. Old Rt. 4 N. of French Camp R. B. Xing,				
N. on 5.....			*	*
S. on 5.....			4,370	3,355
N.W. on C.R.....			5,051	4,047
S.E. on C.R.....			877	778
Mossdale Jc. Rt. 66 to Manteca,				
N. on 5.....	3,898	2,614	4,125	2,801
E. on 66.....	3,934	2,412	3,821	2,847
S. on 5.....	7,710	4,936	7,837	5,664
Tracy W. of Cy. at Jc. C.R. to Byron Sta.,				
E. on 5.....	7,946	4,582	7,713	5,086
N. on C.R.....	797	613	656	544
W. on 5.....	7,093	4,021	7,119	4,555
* Under construction.				
Altamont at R. R. Sta.				
Livermore E. of Cy. at Jc. C.R. to Livermore,				
E. on 5.....	8,650	4,542	7,753	5,246
S. on C.R.....	2,959	1,913	3,048	2,079
W. on 5.....	5,279	2,730	5,024	3,168
Santa Rita Inn Jc. C.R. to Pleasanton,				
E. on 5.....	6,961	3,701	6,549	4,004
S. on C.R.....	1,216	553	743	418
W. on 5.....	7,446	3,796	6,931	4,112
Dublin Jc. C.R. to Martinez,				
E. on 5.....	7,650	3,796	7,160	4,221
N. on C.R.....	3,849	913	2,202	849
W. on 5.....	9,707	4,020	7,758	4,410
Dublin Jc. C.R. to Niles,				
E. on 5.....	6,595	4,058	7,836	4,507
S. on C.R.....	1,437	522	1,543	616
W. on 5.....	9,763	4,075	8,142	4,490
Hayward Jc. with Castro Valley Road,				
E. on 5.....	12,888	4,847	10,738	5,592
N.W. to Castro Valley.....	3,335	1,853	2,546	1,809
S.W. on 5.....	9,514	3,394	8,229	3,601
At Alameda Co. Hospital.....	12,459	4,822	9,171	4,113
Hayward, S. of Cy. Lts.....	10,840	5,084	10,668	4,917
Niles N. at Hotel Bevelor.....	9,014	3,703	9,063	3,646
Niles at Jc. Niles Canyon Road,				
N. on 5.....	8,385	4,100	8,349	4,563
E. on C.R.....	2,759	1,134	2,874	1,456
S. on 5.....	7,731	3,885	7,658	4,454
Niles S. of Cy. at Jc. C.R. to Centerville,				
N. on 5.....	7,254	3,638	7,382	4,286
W. on C.R.....	2,305	1,760	2,294	1,908
S. on 5.....	5,362	2,311	5,553	2,756

Station Location	July, 1930		July, 1931		Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
Mission San Jose Jr. C.R. to Livermore					La Canada at School St.	5,125	4,728	6,662	3,772
N. on 5.	5,179	1,901	5,168	2,187	Pasadena E. of Cy. Lts.	11,872	7,645	8,747	5,118
E. on C.R.	2,100	1,395	2,588	1,568	Azusa W. of City Limit.	11,494	6,981	13,278	7,014
S. on 5.	7,231	2,905	7,807	8,496					
9 Mi. N. of San Jose Jr. C.R. to Centerville					District VIII				
N. on 5.	6,802	2,473	7,380	3,316	S. Rd.-L. A. Co. Line.	8,124	3,259	7,446	3,315
N.W. on C.R.	7,276	2,687	6,557	2,676	Uplands E. of Cy. at Jr. C.R. to Uplands.				
S. on 5.	14,110	5,192	14,032	5,986	W. on 9.	5,501	2,457	*	*
5 Mi. N. of San Jose	12,934	9,054	15,669	7,394	S.W. on C.R.	1,863	1,690	*	*
San Jose N. of Cy. at Jr. with Gish Road	12,673	6,411	10,789	6,503	E. on 9.	7,408	3,967	*	*
San Jose W. of City at Sanitarium	12,154	10,495	13,001	11,819	Uplands at Euclid Ave. Intersection.				
Los Gatos N. of City.	6,714	2,979	6,591	3,221	W. on 9.	7,296	8,417	7,114	4,205
Los Gatos S. of City Lts.	10,830	3,905	12,160	4,639	N. on Euclid Ave.	3,414	1,971	3,151	3,035
Santa Clara-Santa Cruz Co. Line.	9,000	2,616	12,200	3,772	S. on Euclid Ave.	3,681	2,415	4,236	4,833
Santa Cruz N. of City	9,020	3,558	8,571	3,494	E. on 9.	5,728	2,817	8,575	5,228
					S. Rd. W. of City	7,358	5,587	7,122	5,050

Route 6. Sacramento to Woodland Junction

District X

West of Sacramento, W. of Underpass	6,997	5,195	5,356	4,448
Davis E. of Cy. Underpass	6,077	4,519	4,286	3,338
Woodland Wye Jr. Rt. 7 W. to Benicia and N. to Woodland.				
E. on 6.	5,658	4,161	4,337	3,527
W. on 7.	5,290	3,694	4,348	3,359
N. on 7.	3,194	2,527	1,976	1,722

Route 7. Tehama Junction to Benicia

District X

Benicia N. of City	915	552	749	398
Cordelia Jr. Rt. 8 to Napa.				
S. on 7.	428	337	407	268
W. on 8.	5,099	3,074	4,752	3,072
E. on 7.	5,285	3,355	4,958	3,294
West of Cordelia, Old Jr. Rts. 7 and 8.				
S. on 7.	770	540	713	432
E. on C.R.	727	485	596	412
N. on 7.	466	315	452	295
Fairfield E. of City	5,815	4,086	5,131	3,644
Dixon S. of City	4,569	3,379	4,265	3,121
Woodland Wye Jr. Rt. 6.				
W. on 7.	5,290	3,694	4,348	3,359
E. on 6.	5,658	4,161	4,337	3,527
N. on 7.	3,194	2,527	1,976	1,722

District III

Woodland S. of City	3,094	2,717	2,329	2,178
Woodland N. of City at Browns Corner Jr. with C.R. W. & S.				
E. on 7.	3,356	3,108	3,041	2,904
S. on C.R.	278	274	314	319
W. on C.R.	1,544	1,397	1,203	1,139
N. on 7.	1,917	1,697	1,788	1,723
Williams S. of City	1,626	1,276	1,369	1,424
Williams N. of City	1,374	1,472	1,862	1,451
Willows S. of City	1,759	1,086	1,390	1,472
Willows N. of City at Maint. Sta.	2,283	2,472	1,581	1,840
Orland N. of City	1,741	1,681	1,586	1,606

District II

Red Bluff, S. of town at Reed Creek Bridge	1,714	1,578	1,530	1,587
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Route 8. Ignacio to Cordelia via Napa

District IV

Ignacio, Jr. Rt. 1 and 8			3,631	1,151
Petaluma Creek Bridge	3,349	1,167	3,548	1,132
Schellville Jr. Rt. 51 to Santa Rosa.				
S.W. on 8.	3,777	1,248	3,656	1,281
N. on 51.	2,455	815	2,314	992
E. on 8.	1,923	758	2,793	1,122
Jr. Rt. 8 and C.R. to Yineburg.				
W. on 8.	1,988	664	4,199	1,772
E. on 8.	4,653	1,761	2,498	1,035
N. on C.R.	2,860	1,149	1,787	793
Napa Wye Jr. C.R. to Vallejo.				
N. on 8.	8,590	3,895	6,551	3,144
S. on C.R.	10,436	5,161	8,260	4,566
E. on 8.	6,198	3,784	4,869	3,291

District X

Cordelia Jr. Rt. 7.	5,099	3,074	4,752	3,072
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Route 9. District VII

Tujunga W. of Sunset Blvd.	5,329	3,566	5,774	3,443
La Crescenta W. of Penn. Ave.	5,916	4,047	6,955	4,298

Route 10. San Lucas to Sequoia National Park

District V

San Lucas S. of City at Jr. Rt. 2.	152	171	108	108
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District VI

Monterey-Fresno Co. Line.	128	69	120	86
Parkfield Jr.				
W. on 10.	242	117	227	186
S. on C.R.	94	29	115	46
E. on 10.	292	122	332	224
Coalinga S. of City.	560	455	591	495

Coalinga 3 Mi. E. at Jr. C.R. to Oilfields.				
W. on 10.	791	793	855	814
N. on C.R.	167	145	274	257
E. on 10.	627	648	680	680
Oilfields at Oil King School.				
W. on 10.	357	368	450	453
N. on C.R.	188	212	270	297
E. on 10.	320	391	221	215
Kings River Bridge	273	286	300	309
Lemoore Jr. C.R. to Lemoore.				
N. on 10.	549	477	530	551
E. on C.R.	447	445	467	516
S. on 10.	404	342	434	485
Hanford W. of Cy. Lts.	1,591	1,942	1,382	1,821
Hanford E. of Cy. at Intersection C.R. N. to Kingsburg and S. to Corcoran.				

W. on 10.	3,271	3,339	2,941	3,686
N. on C.R.	2,014	1,804	1,592	1,542
S. on C.R.	2,010	1,817	1,770	1,632
E. on 10.	2,566	2,657	2,633	2,122

Goshen, Jr. Rt. 4.				
W. on 10.	1,542	1,184	1,235	1,137
E. on 10.	1,656	1,807	1,698	1,616
Visalia Wye, Jr. Rt. 4 W. to Goshen and S. to Bakersfield				
W. on 10.	2,810	2,604		
S. on C.R.	2,618	2,625		
E. on 10.	4,785	4,435		

Visalia E. to Cy. at Exeter Jr.				
W. on 10.	2,411	2,231	2,095	2,013
S. on Exeter.	1,206	1,172	1,010	1,102
E. on 10.	1,870	1,469	1,443	1,262

Lemoore Jr. C.R. to Woodlake.				
W. on 10.	1,669	834	1,718	806
N. on C.R.	1,116	474	1,297	540
E. on 10.	2,220	872	2,196	902

Three Rivers E. of Town at Jr. C.R. northerly.				
W. on 10.	1,413	621	1,418	676
N. on C.R.	298	96	239	129
E. on 10.	1,389	626	1,288	628

Route 11. Sacramento to Nevada Line via Placerville

District III

Sacramento E. of Cy. Lts.	5,079	3,111	5,034	3,365
Parkers Jr. with C.R. to Plymouth.				
W. on 10.	5,105	3,065	4,890	3,012
S.E. on C.R.	1,495	1,122	1,436	966
E. on 11.	3,981	1,963	3,460	2,071

Folsom W. of Cy. Jr. Pratt Road.				
W. on 11.	2,676	1,525	2,311	1,420
E. on C.R.	737	382	724	423
E. on 11.	2,603	1,242	2,611	1,221
Folsom E. of Cy. at High School.				
N. on 11.	1,406	762	1,384	783
W. on C.R.	555	235	692	406
E. on 11.	1,850	966	1,926	1,063

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Mormon Bar at Inter. with C.R. to Mormon Bar.				
S. on 18.....	2,026	1,162	1,372	1,023
E. on C.R.....	251	176	311	196
N. on 18.....	1,986	1,204	1,374	1,068
Breeceburg to Bear Creek Bridge on 18.....	1,608	964	1,251	930
El Portal Jc. County Road.				
W. on 18.....	1,836	1,052	1,344	937
N. on C.R.....	411	299	393	337
E. on 18.....	1,743	1,066	1,284	903

Route 19. From Route 9 West of Claremont to Riverside

District VIII

Los Angeles Co. Lina E. Cy. Lts.				
Pomona—Old Road.....	9,515	6,826	9,420	7,218
Bet. Pomona & Ontario at Chino Cross Rds.,				
W. on 19, Old Road.....	9,683	6,665	8,922	6,696
N. on C.R., Old Road.....	327	533	327	353
N. on C.R. to Chino, Old Road	1,031	1,215	927	948
E. on 19, Old Road.....	8,908	6,737	8,798	6,798
At S. Bd.-Riv. Co. Line on 19 Old Road.....	3,649	2,103	3,540	2,393
Wineville E. of Cy., Old Road.....	4,269	2,712	4,108	3,060
Riverside W. of Cy. at Santa Ana River Bridge, Old Road.....	6,417	5,387	5,865	5,373
Los Angeles Co. Lina E. City Limits Pomona, New Road.....	3,837	3,173	4,378	3,897
Bet. Pomona & Ontario at Chino Cross Rds.,				
N. on C.R.....	1,190	1,124	1,207	1,195
S. on C.R.....	1,618	1,405	1,697	1,481
E. on 19.....	3,053	2,368	3,517	2,739
W. on 19.....	3,473	2,692	3,856	3,223
East of Ontario, E. Cy. Lts. at Jc. of New S. Bd.-19-B, with Old Road.				
W. on 19, New Road.....	1,758	1,147	2,122	1,533
E. on 19, Old Road.....	4,109	2,594	4,069	3,026
N.W. on 19, Old Road.....	2,534	1,692	2,300	1,809

Route 20. Route 1 Near Arcata to Redding via Weaverville

District I

Arcata N. of Cy. at Jc. Rt. 1.....	1,433	688	1,611	799
Blue Lake, Mad River Br. East.....			266	179
Willow Creek Jc. C.R. to Hoops,				
W. on 20.....	170	128	185	140
N. on C.R.....	188	129	195	117
E. on 20.....	187	124	223	139
Humboldt-Trinity Co. Lina.....	337	260	264	171

District II

Big Bar Vicinity.....	96	90	124	108
Weaverville, 3 Mi. S.....	296	185	206	237
Ret. Redding & Tower House.....	288	220	368	296

Route 21. Route 3 Near Richvale to Quincy

District III

Richvale Wye.....	486	459	439	384
Oroville W. Jc. Marysville Road,				
E. on 21.....	1,124	1,223	1,722	1,663
W. on 21.....	1,999	1,821	978	1,062
S. on Marysville Road.....	963	712	813	671
Oroville E. of Cy., Ridge Rd.....	1,966	1,508	2,266	1,824
River Road.....	286	208	227	195
Feather River Br.			147	44
Miners Ranch.				
E. on 21.....	867	403	1,002	412
S. on C.R.....	329	266	276	183
W. on 21.....	1,069	576	1,153	542
Bidwell Bar Bridge.....	623	278	691	285
Berry Creek.....	327	174	398	180
Meadow Valley.				
W. on 21.....	164	147	299	249
N. on C.R.....	125	121	105	133
E. on 21.....	173	158	262	204
Quincy.....	443	336	501	312
Quincy, Spanish Creek Br. at Road to Keddie.....			614	467
Parton, Jc. Indian Falls Rd.,				
E. on 21.....			322	335
W. on 21.....			182	96
N. on C.R.....			857	325
Quincy, E., Jc. Marysville Rd.,				
E. on 21.....			369	257
W. on 21.....			353	269
S. on C.R.....			84	58

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Beckwith, Jc. Sierraville Rd.,				
E. on 21.....			377	297
W. on 21.....			396	286
S. on C.R.....			159	108

Route 22. San Juan Bautista to Route 32 via Hollister

District V

San Juan Bautista S. of Cy. at Jc. Route 2.....	3,381	2,113	3,100	2,145
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District IV

Hollister, Jc. Rt. 32.....	1,121	735	521	232
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Route 23. Saugus to Route 11 at Alpine Junction

District VII

Saugus Jc. with Rt. 4.....	3,298	1,628	3,299	2,140
Palmdale S. of Cy. Lts.....	2,133	1,490	2,049	1,533
Lancaster Jc. with Rt. 59 to Neenach,				
S. on 23.....	1,923	1,715	2,371	2,598
N. on 59.....	758	830	831	1,043
N. on 23.....	1,334	1,106	1,276	1,235
Los Angeles-Kern Co. Line.....	827	623	867	732

District IX

Mojave Jc. Rts. 58 and 23,				
S. on 23.....	804	566	882	661
E. on 58.....	146	114	178	155
N. on 23.....	892	648	1,041	808
Mojave Jc. C.R. to Bakersfield,				
S. on 23.....	814	611	878	728
N.W. on C.R.....	293	226	345	311
N. on 23.....	524	391	633	517
Freeman 1 Mi. N. Jc. to Rt. 57,				
S. on 23.....	256	200	501	394
W. on 57.....	80	76	72	61
N. on 23.....	236	223	501	427
Kern-Inyo Co. Line.....				
Ojancha Jc. C.R. to Keeler,				
S. on 23.....	564	484		
E. on C.R.....	36	48		
N. on 23.....	577	475		
Lone Pine S. Cy. Lts. C.R. to Keeler,				
S. on 23.....	701	525	685	563
E. on C.R.....	164	139	189	138
N. on 23.....	847	638	857	673
Big Pine Jc. Rt. 63 to Oasis,				
S. on 23.....	829	580	979	740
E. on 63.....	99	110	131	182
N. on 23.....	822	593	980	733
Bishop ½ Mi. N. at Jc. C.R. N. to Laws & Dirt Road Easterly,				
S. on 23.....	1,299	1,123	1,451	1,113
N. on C.R.....	131	402	298	293
E. on C.R.....	65	45	50	31
W. on 23.....	941	751	1,336	854
Levinning Jc. Rts. 40 and 23,				
On 40.....	281	269	279	315
On 23.....	378	368	587	657
Mono-Inyo Co. Line.....	710	515	1,056	594
Mono-23-1.....	274	305		
Bridgeport at E. Cy. Lts.....	354	359		
On Mono-23-K.....	257	260	567	550
Sonora Jc., Jc. Rts. 13 and 23,				
S. on 23.....	113	122	371	309
W. on 13.....	68	70	110	89
N. on 23.....	110	151	368	306
S. of Markleville Jc. Rt. 24,				
On 23.....	65	43	123	87
On 24.....	65	43	121	81
Jc. S.H. and C.R. at Woodfords,				
S.E. on 23.....	104	55	169	103
N.E. on C.R. to Minden.....	259	48	247	121
N.W. on 23.....	203	59	244	149
Pickette Jc., Jc. Rt. 34,				
E. on 23.....	208	92	240	124
W. on 34.....	184	79	222	97
N.W. on 23.....	183	90	217	134
Jc. Rt. 11.....	100	82	150	102

Route 24. Route 4, Near Lodi, to Route 23, Near Silver Creek

District X

Lodi Jc. Rt. 4.....	1,542	1,536	1,311	1,261
Jc. Rt. 24 and C.R. to Lodi,				
W. on 24.....	2,655	1,006	1,864	1,094
N. on C.R.....	1,091	541	1,086	565
E. on 24.....	1,159	570	883	598
Ret. San Andreas and Valley Springs	1,045	410	794	352

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Jc. Rt. 24 & C.R. to Vallecita,				
N. on 24	690	284	698	321
S. on C.R.	202	97	183	111
W. on 24	693	288	691	318
Jc. Rt. 24 and C.R. to Murphys,				
N. on 24	746	298	773	336
S. on C.R.	654	332	658	359
E. on 24	1,033	391	1,018	465

Route 25. Nevada City to Downieville

District III

Nevada City N. of Cy.	478	335	446	293
Camptownville S. 1½ Mi. Jc. Marysville Rd.				
N. on 25			304	188
S. on 25			275	163
W. on C.R.			111	57
Camptownville N. of Cy.	278	228		
Downieville Jc. Rts. 25 and 36,				
W. on 25	293	239	333	211
N. on 36	5	3	5	3
E. on 25	295	240	335	217

Route 26. San Bernardino to El Centro

District VIII

S. Bd. S. of Cy. at N. end Santa Ana R. Bridge, Jc. C.R. to Colton,				
N. on 26	2,471	2,559	3,342	8,268
W. on C.R.	2,835	2,072	2,686	2,182
S. on 26	4,596	4,064	5,398	4,675
Bet. S. Bd. & Redlands on 26 at Jc. of Hunt's Lane,				
S. on C.R.	568	475	430	302
E. on 26	4,681	3,992	5,322	4,534
W. on 26	4,719	4,141	5,311	4,622
At Interx. with Mt. View Ave. W. of Redlands,				
E. on 26	4,238	3,462	4,623	3,917
S. on C.R.	779	839	890	773
N. on C.R.	924	931	822	816
W. on 26	4,302	3,550	4,726	4,044
Colton Ave. at W. Cy. Lts. of Redlands	4,754	4,309	4,972	4,568
S.W. of Redlands Jc. C.R. to Yucaipa,				
N.W. on 26	2,701	2,505	2,644	2,593
E. on C.R.	562	613	518	565
S.E. on 26	2,170	1,896	2,159	2,056
At S. Bd. Riv. Co. Line	2,396	1,979	2,492	2,169
Reamont Jc. Jack Rabbit Trail,				
N.W. on 26	1,942	1,601	2,445	1,814
W. on Jack Rabbit Trail	1,042	652	883	724
E. on 26	2,632	2,097	2,756	2,363
Banning W. of Cy. Lts.	2,956	2,257	2,827	2,443
At Jc. with C.R. to Palm Springs,				
E. on 26	1,318	1,148	1,337	1,208
S.E. to Palm Springs	258	189	228	229
W. on 26	1,469	1,317	1,420	1,357
Coachella S. of Cy. at Jc. C.R. to Thermal and Mecca,				
N. on 26	1,382	1,353	1,381	1,395
E. on C.R.	272	244	205	201
W. on C.R.	223	232	231	211
S. on 26	1,242	1,092	1,241	1,191
1 Mi. S. of Indio at Jc. of C.R. S. to Coachella and Thermal and Mecca,				
N. on 26	1,976	2,036	1,832	2,078
S.E. on 26	1,100	988	979	1,092
S. on C.R.	915	1,126	774	972
At Imp. Co. Line	681	622	830	846
Vendell's Service Sta. 5 Mi. W. of Westmoreland	830	862	949	982
Westmoreland E. of Cy. Lts.	1,703	1,659	1,706	1,786
Bravley at W. Cy. Lts. Jc. with Western Ave.,				
W. on 26	2,311	2,505	2,572	2,910
N. on Cy. St.	241	243	285	252
E. on Cy. St.	2,261	2,412	2,423	2,901
S. on Cy. St.	441	430	516	488
Bravley Jc. S.W. of Cy.,				
S. on 26	2,619	3,018	2,589	3,004
N. on Cy. Street	2,929	2,671	2,275	2,644
N.W. on C.R.	388	441	474	482
El Centro W. of Cy. Jc. Rt. 12	3,873	4,097	3,949	4,288

Route 27. El Centro to Yuma

District VIII

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 18
El Centro E. of Cy. at Jc. C.R. N. to Hrawley and S. to Calexico,				
W. on 27	3,636	3,226	4,149	3,268
N. on C.R.	249	236	562	400
S. on C.R.	502	253	491	312
E. on 27	2,585	3,110	4,114	3,242
E. of Holtville	1,896	1,905	2,950	3,561
Sand Hills Maint. Sta. on Rt. 27	585	488	669	567
Yuma at S.D. A. Plant Quarantine Sta.	2,293	1,887	2,265	1,946

Route 28. Redding to Nevada Line via Alturas

District II

Redding S. of Cy. at Jc. with Rt. 3	723	756	736	803
Montgomery Creek	189	291	215	175
4 Mi. E. of Pittville at Maint. Sta.	167	153	341	291
Canby	268	253	278	324
5 Mi. N. of Alturas at Jc. Lakeview Rd.,				
S. on 28	322	222	314	245
N. on C.R.	172	125	181	107
E. on 28	168	109	174	136
East of Cedarville, 2 Mi.	141	51	188	101

Route 29. Red Bluff to Nevada Line Near Purdy's

District II

Red Bluff E. at Jc. Rt. 3	987	820	976	725
Morgan Springs at Tehama-Plumas Co. Line	528	349	704	413
2 Mi. W. of Westwood	947	628	1,030	605
Susanville 1 Mi. W. of Town	855	579	1,030	586
Susanville 1 Mi. E. of Town	1,719	1,524	1,765	1,567
Janeville			773	548
12 Mi. E. of Milford at Maint. Sta.	288	220	317	251
5 Mi. S. of Constantia at Maint. Sta.	289	242		
Jc. Quincy Rd. with Rt. 29				
Rt. 29			322	244
C.R.			358	242

Route 31. San Bernardino to Nevada Line Near Jean

District VIII

North of Cy. at Jc. with Mt. Vernon and Highland Ave.,				
S. on Mt. V.	3,728	2,532	3,432	2,191
E. on Highland	3,983	2,019	4,193	2,159
W. on Highland	2,791	102	2,449	1,220
N.W. on 31	1,699	1,721	1,464	946
Vermont Jc. Rt. 31 and Kendall Dr.,				
N. on 31	2,670	1,504	2,510	1,508
S. on 31	2,124	1,134	771	1,372
S. on Kendall	698	516	2,417	552
Jc. Rt. 31 with State Street,				
N.W. on 31	2,276	1,222	2,143	1,256
S. on State	820	355	872	407
S.E. on 31	1,689	1,090	1,558	1,003
N. of Cajon Jc. C.R. to Swartout Valley,				
S. on 31	2,299	1,029	2,535	1,626
W. on C.R.	925	234	968	255
N. on 31	1,416	1,254	1,685	1,440
Victorville S. of Cy. Lts.	1,481	1,251	1,594	1,255
Helendale	920	766	964	862
S.W. Town Lts. of Barstow	937	847	1,031	992
Yermo E. of Cy. Lts.	416	334	494	423
Baker	396	374	426	399
Nevada State Line	324	308	346	359

Route 32. Route 2, Near Gilroy, to Route 4, Near Califa

District IV

Hollister Jc. Rt. 22,				
W. on 32	1,110	683	721	626
S. on 32	1,121	735	521	256
E. on 32	1,913	1,223	1,227	808
Pacheco Pass at Santa Clara-Merced Co. Line	1,901	1,130	1,597	987

District VI

Junction-Jc. C.R. to Gustine,				
W. on 32	1,144	1,878	1,611	1,066
N. on C.R.	470	253	441	274
E. on 32	1,395	972	1,270	841
Los Banos at Jc. S.P. Crossing (Near Maint. Yard)	2,884	2,641	3,006	3,033

Station Location	July, 1930		July, 1931		Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13		Sun. 13	Mon. 14	Sun. 12	Mon. 13
E. of Los Banos at Jc. C.R. to Dos Palos,					Truckee E. of Cy. at Jc. with Rd. 38 to Nevada Line,				
W. on 32.....	2,401	1,929	1,844	1,639	W. on 37.....	1,305	907	3,210	1,943
S. on C.R.....	1,077	1,013	889	855	E. on 38.....	1,300	905	2,775	1,599
E. on 32.....	2,469	1,713	1,763	1,387	N. to Hobart Mills.....	235	151	477	204
Merced-Madera Co. Line at Jc. C.R. to Merced,					Route 38. Myers to Nevada Line via Truckee River				
W. on 32.....	1,886	1,205	1,378	1,108	District III				
N. on C.R.....	718	518	533	492	Mays, Jc. Rts. 38 and 11,				
E. on 32.....	1,347	816	992	772	N. on 33.....	687	412	842	526
Califa Jc. Rt. 4.....	618	716	906	762	E. on 38.....	690	396	868	543
Route 33. Paso Robles to Route 4, Near Bakersfield					E. on 11.....	624	381	856	494
District V					Pomona			2,141	1,563
Paso Robles E. of Cy. Lts.....	1,337	1,386	1,450	1,413	Tahoe City Jc. Rt. 39,				
Paso Robles 1 1/2 Mi. E. of Cy. Lts.....	1,040	997	1,121	913	S. on 33.....	1,608	1,118	1,698	1,287
Shandon Maint. Yard.....			670	516	E. on 39.....	1,353	1,044	1,470	1,151
District VI					N. on 38.....	1,292	686	1,512	816
S. L. O.-Kern Co. Line.....	433	216	534	348	Truckee, W. of Cy. at Jc. Rt. 37.....	1,287	1,102	2,556	1,508
Blackwell's Cvr. Jc. C.R. N. to Coalinga and S. to Taft,					Truckee, E. of Cy. at Jc. Rt. 37.....	1,300	905	2,775	1,599
W. on 33.....	340	199	386	267	California-Nevada State Line.....	2,255	1,156	2,907	1,486
N. on C.R.....	115	127	210	229	Route 39. Tahoe City to Nevada State Line				
S. on C.R.....	171	127	238	197	Tahoe City Jc. Rt. 38.....	1,323	1,044	1,470	1,151
E. on 33.....	282	207	371	326	Near Brockway Jc. C.R. to Truckee.....	857	490	1,180	751
Lost Hills Inters. of Main St.,					Route 40. Route 13, Near Montezuma, to Route 23, Near Mono Lake				
W. on 33.....	492	445	712	663	District X				
N. on Main.....	13	16	35	55	Mt. Pass Jc. Rt. 13.....	347	182	400	185
S. on Main.....	101	128	192	167	1 Mi. E. of Greveland on 40.....	346	202	452	289
E. on 33.....	492	458	641	585	Mono 40-A. Jc. with Mono-23-H.....	281	269	279	315
Wasco Jc. Co. Rd. S. to Wasco, near S. P. R. R. Xing,					Route 41. General Grant Park to Kings River Canyon				
W. on 33.....	781	715	754	783	District VI				
S. on C.R.....	847	897	710	823	W. of Hume		176	122	226
E. on 33.....	715	651	765	783					52
Famosa Jc. Rt. 4.....	571	458	576	584	Route 42. Saratoga Gap to State Redwood Park				
Route 34. Route 4, Near Arno, to Route 23, at Picketts Junction					District IV				
District X					Waterman Switch,				
Twin Cities Jc. Rt. 4.....	987	461	404	355	E. of Saratoga Gap on 42-A.....	2,530	534	1,483	194
W. of Jone Jc. C.R. to Michigan Bar,					W. of Redwood Park on 42-A.....	1,397	239	664	34
W. on 34.....	106	71	88	35	S. on C.R. to Boulder Creek.....	1,388	394	908	208
N. on C.R.....	72	54	49	53	Saratoga Gap at Redwood Park Gate	2,636	552	1,462	85
E. on 34.....	126	92	92	78	Route 43. San Bernardino to Big Bear Lake				
W. of Jackson Jc. Rt. 65 to Placer-ville,					District VIII				
E. on 34.....	1,282	1,289	706	691	Foot Waterman Grade.....	4,508	1,473	6,148	2,343
S. on 65.....	876	963	491	495	Waterman Canyon Jc. of New Forest Highway with Old Rd. on Switch-backs Above Old Panorama Point,				
N. on 34.....	592	436	354	239	Old Rd. above Jc.....	861	254	90	41
Pine Grove E. of Town,					New Rd. above Jc.....	3,549	935	5,805	1,797
W. on 34.....	404	267	539	277	New Rd. below Jc.....	4,168	1,192	5,844	1,828
N. on C.R.....	367	232	259	178	Squirrel Inn Jc. of New Forest Hwy. with Old Crest Drive,				
E. on 34.....	769	474	785	433	W. Old Rd.....	539	190	1,518	309
Itanget Sta. Jc. C.R. to P. G. & E.,					E. on 43.....	3,374	983	1,384	513
E. on 34.....	372	85			N.E. on Old Rd.....			797	223
S. on C.R.....	48	53			S. on 43.....	3,616	968	3,036	821
W. on 34.....	399	138			Traffic up New Forest Hwy. turning toward Crestline.....			317	117
Jc. C.R. to Silver Lake,					Traffic from Crestline turning down New Forest Hwy. at Squirrel Inn Jc.....			347	142
E. on 34.....	255	88	313	99	Placercrest Jc. C.R. to Lake Arrow-head,				
S. on C.R.....	193	59	220	65	S.W. on 43.....	3,432	987		
E. on 34.....	320	81	243	96	N.E. on C.R.....	3,456	961		
Picketts Jc. Rt. 23 and 34.....	184	79	222	97	N.W. on C.R.....	252	129		
Route 35. Peanut to Kuntz					E. on 43.....	56	65		
District I					Jc. Burnt Mill Canyon,			2,581	794
At Peanut.....			58	39	N. on 43.....			1,619	672
Forest Glenn.....	44	38			E. on 43.....			3,068	1,013
Route 37. Auburn to Nevada Line Near Verdi					Jc. Kuefcl Canyon,			422	227
District III					N. on C.R.....			803	448
Auburn E. of Cy.....	2,737	1,750	3,236	2,188	W. on 43.....			1,335	636
Colfax E. of Cy. Grass Valley Road,					Running Springs Park Jc. Cy. Creek Rd.,				
W. on 37.....	2,077	1,169	2,366	1,495	N. on 43.....	611	153	1,510	535
N. on C.R.....	368	179	256	177	E. on Cy.-C.R.....	1,315	358	505	148
E. on 37.....	2,014	1,892	2,322	1,398	E. on 43.....	1,807	477	1,925	650
Emigrant Gap Jc. Rts. 15 and 37,					W. end of Bridge over Big Bear Dam,				
W. on 37.....	1,695	916	1,974	1,170	W. on 43.....	1,564	502	1,788	814
W. on 15.....	90	32	211	85	E. over Dam.....	1,516	528	1,662	614
E. on 37.....	1,662	925	1,998	1,184	N.E. on 48.....	805	294	831	296
Donner Lake Camp.....	1,817	902	1,952	1,150					
W. of Truckee, Jc. with Rt. 38 S. to Lake Tahoe,									
W. on 37.....	1,230	1,181	2,937	1,846					
S. on 38.....	1,287	1,102	2,550	1,508					
E. on 37.....	1,580	1,218	4,193	2,787					

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
1 Mi. from end of Rt. 43 Je. C.R. to Pineknoll.....				
W. on 43.....	382	165	369	166
S. on C.R.....	603	265	145	43
E. on 43.....	666	330	396	168
Mill Creek Lower Control—S. Bd. C. Je. Big Meadows, S. to Redlands.....	428	157		
E. to Big Meadows.....	276	91		
S. to Big Bear Lake.....	189	87		
Big Bear Lake Desert Rt. Je. E. of Baldwin Lake, N. to Desert.....	163	53		
W. to Big Bear Lake.....	136	48		
S. on E. side of Baldwin Lake	54	7		

Route 44. Boulder Creek to Redwood Park

District IV

Boulder Creek at Park Line.....	2,771	1,396	3,113	1,495
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Route 45. Willows to Route 3, North of Biggs

District III

Willows E. of City.....	716	782	561	708
Four Corners, W. of Butte City, N. on 45.....	464	389	369	371
E. on 45.....	451	438	444	398
S. on C.R.....	546	478	568	446
W. on C.R.....	184	196	142	163
Butte City E. of City, W. on 45.....	253	243	277	223
N. on C.R.....	136	124	143	144
S. on C.R.....	35	35	21	34
E. on 45.....	124	122	135	117
Cherokee Canal Je. with C.R. to Richvale, W. on 45.....	152	119	149	199
N. on C.R.....	103	134	123	148
E. on 45.....	137	112	125	174

Route 46. Route 1, Near Klamath River, to Route 3, Near Cray

District I

Welchpce, Je. Rt. 46 & C.R.....			22	22
C.R. to Hoopa.....			38	35
C.R. to Orick.....			73	41
E. on 46.....			85	78
Thompson Creek.....			117	87

District II

Cray N. of Cy. Je. Rt. 3.....	356	276	273	221
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Route 47. Orland to Chico

District III

Orland E. of City.....	1,018	1,057	1,604	1,139
Gianelli Bridge.....	918	662	850	695
Chico W. of Cy., W. on 47.....	1,365	1,130	1,433	1,745
S. on C.R.....	495	542	699	969
N. on C.R.....	130	124	299	396
E. on 47.....	1,656	1,437	1,818	2,120

Route 48. Near McDonalds to Mouth of Navarro River

District IV

McDonalds Je. Rt. 1.....	326	254	430	344
Boonville on 48.....	511	355	615	487
Navarro 2.3 Mi. W. of Town.....	410	362	422	510

Route 49. Calistoga to Lower Lake

District IV

N. of Calistoga at Foot of Grade.....	1,887	823	1,053	841
Middletown Je. Cobb Mt. Rd., N. on 49.....	1,873	1,252	1,851	1,278
S. on 49.....	2,531	1,436	2,310	1,474
W. on C.R.....	955	790	852	638
Lower Lake Je. Kelseyville and Lower Lake Rd., S. on 49.....	996	495	924	647
E. on L. L. Rd.....	1,236	752	1,198	814
W. on K. Rd.....	563	394	469	341

Route 51. Santa Rosa to Schellville

District IV

Santa Rosa E. of City.....	4,267	2,684	3,728	2,733
8 Mi. E. of Santa Rosa at Sonoma Cr. Bridge.....	2,874	1,387	2,353	1,321
Schellville Je. Rt. 8.....	2,455	845	2,314	892

Route 52. Alto to Tiburon

District IV

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 13
Belvedere Je. Rt. 1.....	1,694	940	1,350	811

Route 53. Fairfield to Lodi via Rio Vista

District X

Denver at Overhead Xing.....	737	453	790	739
Rio Vista Bridge E. End, W. on 53.....	1,677	1,533	1,516	1,352
N. on 53.....	2,253	1,725	1,917	1,491
S. on C.R.....	1,431	1,044	1,240	845
Walnut Grove Bridge N. End, E. on 53.....	2,058	1,659	2,184	1,758
S. Over Bridge.....	601	495	573	619
W. on C.R.....	2,367	1,968	2,212	1,968
Isteton Br. East End, N. on 53.....	519	457	864	998
S. on 53.....	3,185	2,345	2,888	2,286
W. over Br.....	2,746	1,972	2,426	1,941
Thornton Inter. C.R., E. on 53.....	1,701	1,438	1,239	1,181
N. on C.R.....	692	611	452	444
W. on 53.....	1,295	1,683	1,162	966
Lodi N. of City.....	3,356	2,677	1,560	1,277

Route 54. Near Michigan Bar to Central House

District X

Central House Je. Rt. 65 to Placer- ville and Jackson, W. on 54.....	610	445	775	475
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Route 55. San Francisco to Route 5 Near Glanwood

District IV

Swimming Pool.....	18,963	5,568	9,832	2,544
Je. C.R. to Colma, N. on 55.....	11,536	1,993	7,387	1,275
E. on C.R.....	4,223	1,158	3,471	942
S. on 55.....	10,985	2,374	8,667	1,890
Je. C.R. to Belmont at Dirt Dao, N. on 55.....	7,119	1,171	5,871	896
S.E. to Belmont.....	3,076	662	2,478	342
S. on 55.....	7,048	1,468	7,823	977
Je. with C.R. West to Half Moon Bay, N. on 55.....	6,310	1,352	6,998	958
W. on C.R.....	3,267	779	4,645	676
S. on 55.....	3,228	666	3,283	354
Saratoga Gap, N. on 55.....	1,870	355	1,545	111
S. on 55.....	18	5	42	10
E. on C.R.....	1,020	222	*	*
W. on 42.....	2,636	552	1,462	85
S. Cl-S. Cr. Co. Line Je. Rts. 5 and 55.....	51	52	87	69

* Under construction.

Route 56. District V

S. of Carmel Interx. Carmel Valley and Big Sur Roads.....	2,096	1,107	2,844	1,447
10 Mi. S. of Carmel at Garra- pitas Ck.			406	192
San Simeon 1 Mi. S.	452	232	459	222

Route 57. Santa Maria to Freeman via Bakersfield

District V

Santa Maria N. of Cy. at Je. Rt. 2 At Interx. Rt. 57 and Suey Road, W. on 57.....	327	169	283	146
S. on Suey Rd.....	173	67	152	113
E. on 57.....	460	179	408	198
Ret. 2d Chuyana Xing and Kern Co. Line on 57 B. C.	293	178	281	197

District VI

S. L. O.-Kern Co. Line.....	444	194	337	296
Maricopa W. of Cy.....	606	593	649	585
Pentland at R. R. Xing.....	1,616	917	546	518
Bakersfield Je. C.R. to Connor, W. on 57.....	291	231	348	275
N. on C.R.....	78	79	47	59
E. on 57.....	221	157	315	232
Je. Rt. 57 and 4.....	225	169	319	247
Bakersfield E. Nile and School House Easterly Cy. Lts.....	2,984	2,572	2,762	2,534
Bakersfield 10 Mi. E. at Je. Co. Club Rd. and Ker-57 E. on 57.....	1,362	854	1,128	874

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 18
Hodfish at Interx. Rt. 57 with C.R. to Caliente.....				
E. on 57.....	913	130	371	191
S. on 57.....	287	124	297	195
S. on C.R.....	44	98	50	27

Route 58. Mojave to Arizona Line Near Topec via Barstow

District IX				
Mojave	146	114	178	155

District VIII				
Kramer-Kern Co. Line.....	105	102	105	109
Barstow N. of Cy. at Jc. 31 to Yermo.....				
S. on 58.....	1,647	924	1,247	1,171
N. on 58.....	467	471	615	576
N.E. on 31.....	609	471	622	544
Daggett Jc. Arrowhead Trail Old Trails Hwy.,.....				
N. on C.R.....	111	107		
W. on 58.....	577	506	239	194
E. on 58.....	529	460	214	184
Vicinity Newberry Springs.....	461	393	414	364
Vicinity Ambury.....	465	377	385	285
Near Bannek Jc. C.R. to Search- light.....				
W. on 58.....	336	297	320	317
N. on C.R.....	30	34	65	51
E. on 58.....	360	304	368	365
Needles W. of Cy. Lts.....	601	568	546	560
Needles 5.7 Mi. S. Jc. to Parker and Blythe.....				
S. on 58.....	203	149	383	241
S.W. on C.R.....	88	48	9	9
N. on 58.....	374	245	390	254

Route 59. Lancaster to Baileys

District VII				
Lancaster Jc. Rt. 23.....	758	830	831	1,043
Bailey Ranch.....	251	94	113	101

Route 60. El Rio to San Juan Capistrano

District VII				
El Rio Jc. Rt. 2 and 60.....	7,870	5,239	7,277	5,636
Oxnard South of Cy. Lts. on Ven.-60-A.....	6,361	4,134	6,113	4,063
Near L. A.-Ven. Co. Line, Jc. Decker C.R.,.....				
W. on 60.....			6,796	3,537
E. on 60.....			6,874	3,587
N. on C.R.....			76	40
Topanga Canyon on 60.....	32,380	14,582	16,355	7,146
On C.R.....			2,842	1,293
Santa Monica Interx. Beverly and L. A. 60-B. Santa Ynez Canyon, W. on 60.....	22,283	16,376	20,734	9,238
On Beverly Blvd.....	13,840	4,966	11,377	2,568
E. on 60.....	48,611	29,211	36,182	16,241
On Santa Monica Canyon Rd.....	21,971	13,365	22,299	7,453
Lomita on Redondo-Wilmington Rd. on 60.....	12,492	9,078	12,655	8,637
Seal Beach at L. A.-Orange Co. Line.....	23,866	12,063	23,539	10,970
Newport W. of Cy.....	16,601	7,137	17,802	7,681
Newport at Interx. Newport-Tustin Rd.,.....				
W. on 60.....	13,630	4,909	12,840	5,183
N. on C.R.....	17,601	9,128	14,790	7,619
S. on C.R.....	14,110	7,293	15,115	6,816
E. on 60.....	16,258	7,192	14,657	6,607
Serra Jc. Rt. 2 and 60.....	7,577	3,902	7,273	3,636

Route 61. La Canada to Mt. Wilson Road via Arroyo Seco

District VII				
Pasadena at N. Cy. Lts.....	3,266	883	2,901	766

Route 63. Big Pine to Oasis

District IX				
Big Pine, Jc. Rt. 23.....	99	110	131	182

Route 64. Mecca to Blythe

Station Location	July, 1930		July, 1931	
	Sun. 13	Mon. 14	Sun. 12	Mon. 18
District VIII				
Desert Center.....	76	46	78	54
Blythe, S. D. A. Quarantine Sta.....	111	57	85	65

Route 65. Auburn to Sonora

District III				
Auburn at Wire Bridge, American River, N. on 65.....	346	229	381	150
E. on C.R.....	115	100	292	102
S. on 65.....	292	233	303	159
Placerville N. of Cy. Jc. George- town Rd.,.....				
N. on 65.....	364	190	345	303
N. on C.R.....	108	85	160	168
S. on 65.....	418	248	340	276
El Dorado Jc. Rt. 11.....	342	181	330	258

District X				
Central House Jc. Rt. 54 to Michi- gan Bar, N. on 65.....	523	432	742	528
W. on 54.....	610	445	775	475
S. on 65.....	578	418	719	594
N. of Jackson Jc. Rt. 34, N. on 65.....	876	963	491	495
E. on 34.....	1,282	1,289	706	691
S. on 34.....	592	436	354	239
S. of San Andreas at Sheep Camp.....			1,130	718
W. of Sonora Jc. Co. Rd. to Jamestown, N.W. on 65.....	223	219	313	238
S.W. on C.R.....	145	143	189	96
S.E. on 65.....	251	219	245	251

Route 66. Manteca to Route 5 Near Mossdale School

District X				
Mossdale Jc. Rt. 5.....	3,934	2,412	3,821	2,847

Route 67. Pajaro River to Route 2 Near San Benito River Bridge

District V				
San Juan Bautista N. of Cy. at Jc. Rt. 2.....	3,861	1,623	3,811	1,740

Route 68. San Francisco to San Jose

District IV				
N. Cy. Lts. S. San Francisco.....	16,774	11,254	26,136	13,672
S. San Francisco at Underpass.....	17,313	9,109	19,598	12,311
Burlingame Jc. Rt. 68 and Broadway, N. on 68.....	15,915	8,723	19,058	16,177
W. on Broadway.....	3,715	3,669	3,302	3,374
S. on 68.....	13,941	6,208	17,138	8,691
San Mateo Jc. 3d Ave., E. on 3d Ave.....			3,642	1,734
W. on 3d Ave.....			4,582	2,446
N. on 68.....			16,360	7,715
S. on 68.....			14,351	7,129

Route 69. San Quentin Road

District IV				
San Quentin Hill.....	4,873	2,618		
Richmond to San Rafael Ferry.....			3,479	1,419

Route 70. District IV

Ukiah Jc. Rt. 1.....	921	1,079	992	1,271
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Route 71. Crescent City to Oregon Line

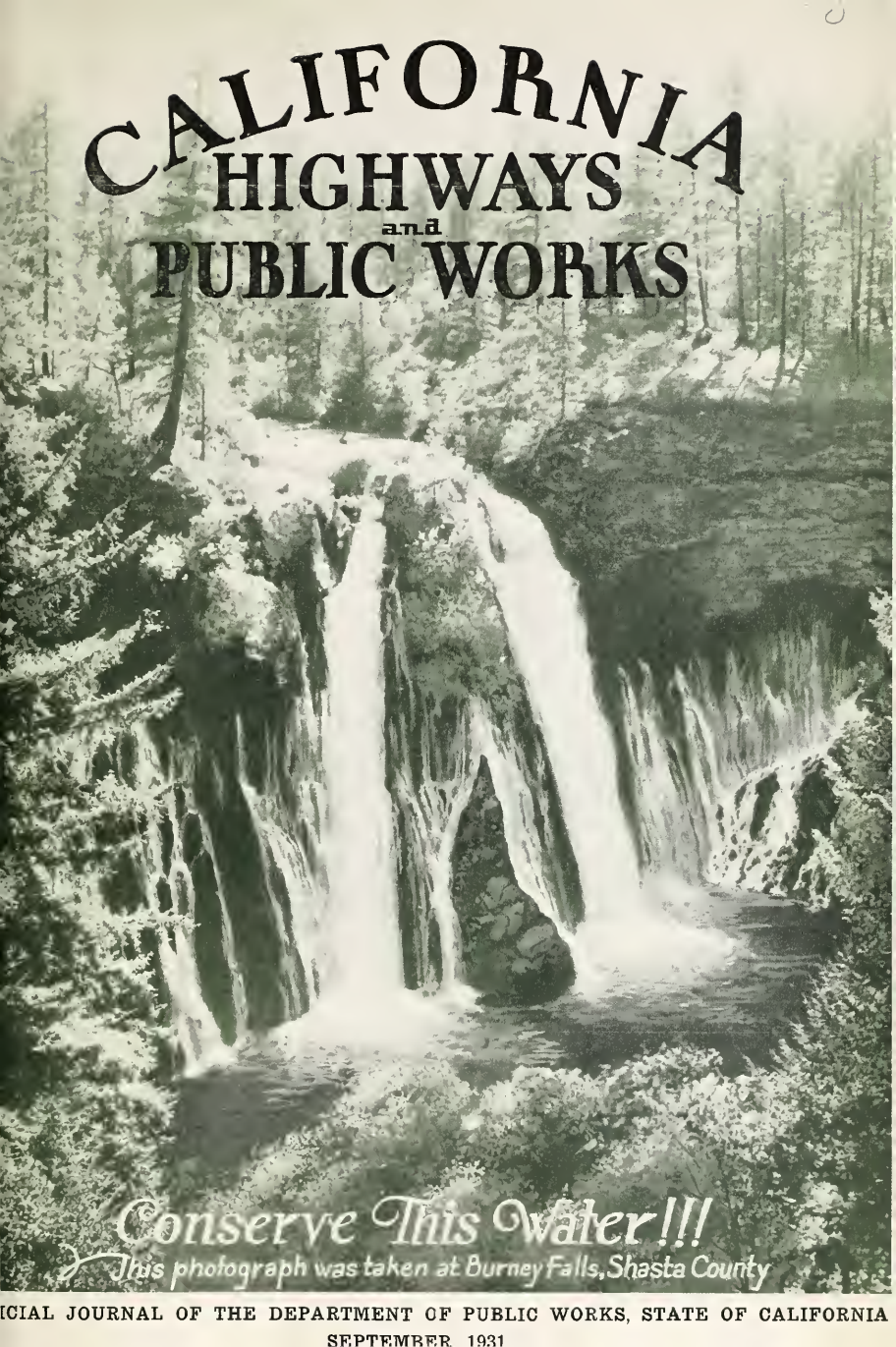
District I				
Crescent City N. of Town at Main, Yard.....	923	974	1,107	1,223
Oregon Line.....	417	387	635	545

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CALIFORNIA STATE PRINTING OFFICE
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SACRAMENTO, 1931



CALIFORNIA HIGHWAYS and PUBLIC WORKS



Conserve This Water!!!

This photograph was taken at Burney Falls, Shasta County

OCT 15 1931

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\$1,500,000 *Allotted for Extra Work This Winter*

Heads of Families Will Be Given Employment for Five Months By Department of Public Works—Men to Be Used Near Community in Which They Live

By COLONEL WALTER E. GARRISON, Director of Public Works


IN FURTHERANCE of State Administration's plan to speed up all public work for the alleviation of unemployment, the Department of Public Works will provide part-time employment for an additional 3800 men during the winter months.

 The larger part of the work will fall under the immediate direction of the maintenance service of the Division of Highways. Something like \$1,500,000 has been appropriated for pay rolls.

The plan calls for men and hand tools. It represents work that under any condition or at any time would call for man power. It is not a machine job; there is discrimination neither for nor against machinery. The work schedule has been simply advanced by a year or more in order to give to the unemployed jobs at a time when jobs are most needed.

NOT CHARITY WORK

The work will not be done haphazard. It will not be created as a charity. The expenditure has been well planned. The emergency simply meets the work. The various jobs will be as carefully laid out and as carefully supervised as any done in the usual efficient construction and maintenance service.

 It is the intention of the Department of Public Works to distribute the improvement work over the State. As far as possible each locality will profit some from the wage returns; and each section will have its share of the improvement benefits.

FOR NEEDY MEN

The semiofficial relief agencies of the several counties and cities will be recognized in proposing work for needy men. In due time, they will be informed as to the quotas that can be cared for, and of the procedure necessary to contact the personal officers.


The invariable rule of employment will be that married men come both first and last.

Preference will positively be given to them. But single men who can prove that they are the sole support of dependents will not be excluded from consideration.

The plan contemplates three days work each week for the men, the crews being divided and working in alternate periods. The wage will be the going wage for laborers, which will probably be \$4 per day.

THROUGH THE WINTER

The Highway Division and its district aids are now working out the state-wide plan. It is expected that the organization will be ready for action by October 15th. Present indications are that the Division will be able to spread the work over a five months' period. This will carry many families through the winter.

 This expenditure of \$1,500,000 will not be in the nature of a gift by the State to the unemployed. The men will earn their money. The State will get dollar for dollar in the betterment of roads and highways.

In pressing the departments for action like that being taken by the Public Works Department, Governor Rolph is doing more than provide work for several thousands of men. He is pointing out to industry everywhere a wise plan to pursue—that of advancing work schedules to meet unemployment and showing confidence in the innate stability of our institutions.

DOING THEIR BIT

I do not doubt that our community leaders will cooperate with us in getting the best results in distributing the benefits of our extra labor program.

We do not for a minute fancy that these few thousand men at work will do more than assist in solving the big problem that lies ahead.

But Governor Rolph and the Department are determined to do their bit, and to do it

(Continued on page 33)

Secret Service Corps Wars on Fires; Incendiarism Blamed for Big Losses

ADDRESSING the "Stop Forest Fires" Committee at its recent session in Los Angeles, Chairman M. B. Pratt, in reporting for the work being done by the Division of Forestry, told the members present that, considering the acute fire menace of the year as warned against last May in the fire proclamation issued by Governor James Rolph, the fire situation had been kept quite well in hand.

The assertion of the State Forester is evidenced by the splendid low fire record maintained through the strenuous season in the southern portion of the State and the few fires occurring in the national forests prior to the July outbreak of incendiarism.

INCENDIARY ORIGIN

"Were it not for fires of incendiary origin in northern and central parts of the State," says Pratt, "the entire fire record of the year would have been held to one of the lowest in the history of fire prevention work."

Pratt contributes the causes of the incendiary outbreak this year to unemployment, boys craving excitement during periods of fires and the long standing desires of selfish interests to rid certain areas of brush for definite purposes.

Carelessness of fires along highways, railroads and stage routes, in logging operations and by sportsmen and recreationists along streams and in the forests, as direct causes of grain, brush and forest fires, has been greatly reduced in the opinion of both State and Federal forest officers, leaving incendiarism at the top of the list of man-caused fires in California this year as well as throughout the great Northwest.

PUBLIC EDUCATED

Forest officers openly express the opinion that the activities of the Department of Public Works in converting the highways into first lines of defense against fires and in educating the traveling public against throwing lighted materials from moving vehicles are getting direct results of a far-reaching nature.

With all man-caused fires, except incendiary origin, actually reduced to almost a minimum by the forces coordinated by Governor

Rolph, the California Fire Emergency Committee through the State Chamber of Commerce is now conducting a stringent campaign to wipe out incendiarism by changing public sentiment.

SECRET SERVICE

The backbone of the campaign in each county is the Vigilante Committee formed by the County Fire Emergency Committee along lines developed by the Placer County Fire Emergency Committee.

The secret service part of the campaign as outlined includes:

(1) State Forester Pratt has appointed a State Chief of 32 years' experience in law enforcement work in charge of the campaign.

(2) Each County Fire Emergency Committee has named a County Chief.

(3) Each County Chief has named a Secret Service Corps, limited in number and deputized as peace officers.

(4) The Vigilante Committee.

(5) A contact man named by the State Chamber.

DRASTIC MEASURES

The latest methods of modern police tactics in secret shadowing, secret patrol and secret signaling will be established between the secret service corps operating in the forests and the vigilantes operating throughout the county.

"I feel this is the most effective method of stopping incendiary fires that has yet been evolved," said the State Forester. "The people demand drastic measures, and the recent arrests and convictions already secured lead me to believe that public opinion will soon have the incendiary situation well under control."

"In the fire problem of California, public opinion must consider the depletion of the State funds in the budget for fire suppression; the deep inroad made on the State Emergency Fund badly needed for other purposes; the losses to counties in assessable valuations; the hindrances to future lumbering operations; destruction of valuable watersheds; destruction of wild life and keeping tourists out of the recreational grounds of the State."

Firebugs Cause Havoc Like This!



RED TONGUES OF DESTRUCTION. Three remarkable close-up photographs taken by the United States Forestry Service showing their men battling against forest fire. Number 1 is a crew of men advancing on the flames with hose attached to a pump engine at nearby stream. No. 2 shows what must be done when water is not available. The three men, armed with shovels, are rushing to a new point of attack, risking their lives to halt the devastation. In No. 3 the men are building a trail down to mineral soil in advance of the fire and throwing dirt on smoldering logs and brush to prevent spread of sparks. And incendiaries have caused most of this summer's fires!

Western State Water Engineers Meet In Sacramento Conference Oct. 28th

THE FOURTH Annual Conference of the Association of Western State Engineers will convene in Sacramento October 28th. It promises to be one of unusual interest not only to the Federal and State representatives, but to the public as well.

Conflicts between Federal and State jurisdiction over the use and control of water which have arisen in recent years will receive attention, as will conservation and administration of the public domain, forethought in the planning of water resources development, and a multiplicity of other subjects which are of vital interest and concern to public officials charged with the responsibility of administering the water resources of the western states and to all thoughtful citizens.

TO EXCHANGE THOUGHTS

The Association originated in the need of western state water officials for some agency or medium for exchange of thoughts and experiences on water matters. The seventeen states having membership are Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming—all of which are arid or semiarid and have many common problems arising from that fact.

Because a solution of these problems requires ready contact with and cooperation of the U. S. Bureau of Reclamation, the Division of Agricultural Engineering of the Department of the Interior, the U. S. Forest Service, the U. S. War Department, the Federal Power Commission, and the U. S. Geological Survey, those Federal offices each have named a representative to serve with the Association as associate member.

LENGTHY PROGRAMS

The Association first met during the Colorado River Conference at Denver in the fall of 1927, and there have since that time been three annual conferences, at Salt Lake City, Reno and Denver. This fourth conference which convenes in Sacramento, will meet October 28th, 29th and 30th.

The programs of previous conferences have included discussion of proper State control

and protection of individual appropriators of underground water, the relation of the Federal government to the states in the matter of control of water, interstate compacts, national legislation of common interest to arid states, duty of water with special reference to adjudication and administration, laws governing construction and operation of dams, measuring devices for apportionment of water, ownership status of return flow, the forecasting of run-off by the snow survey method, future reclamation policy, the proposal to cede unreserved Federal lands to the states, flood control and stream regulation, and many other related subjects.

The benefits of the Association have not been restricted to those intangible values arising out of discussion. The Association has moved with telling effect in connection with a number of important matters vital to the West. Its action in connection with the delay in publication of cooperative stream flow data and topographic maps of the U. S. Geological Survey has had a very tangible result in speeding up this work. Whereas, publication of stream flow data was formerly three and one-half to four years in arrears, the Survey now promises that at the close of this fiscal year, Water Supply Papers will be current. Progress is also being made in reducing arrearage in the publication of topographic maps and it is expected that very shortly one and one-half to two years will be cut from the time heretofore required for publication. The benefits to users of these data can scarcely be overemphasized.

LICENSE FEES

The Association also interested itself in the matter of Federal Power Commission license fees, which it appeared were not being distributed to the states in accordance with the allocation prescribed by the Federal Water Power Act. It has since been ruled by the Comptroller General of the United States that the fees were being erroneously distributed and California alone has already received some \$109,000 in fees which it would not otherwise have received. The allocation to the U. S. Reclamation Fund, which affects

If Your House Gets Shaky, Look Out!

It's the Little Termite Eating Dinner

Termites, deadly enemy of all things wooded and many that are not, are causing tremendous loss throughout California. The writer of this article, an authority on this insidious White Ant, tells a highly interesting and entertaining story of the destructive work of the insect and at the same time sets forth the remedies best fitted to halt the ravages of its attack.

By C. H. KROMER, Chief Structural Engineer, Division of Architecture

INSECT infestation of the wooden portions of certain of the State's buildings, has, within the past few years, given considerable concern to the Division of Architecture, especially since we have every reason to believe that these insects are increasing at an alarmingly accelerated rate. I refer particularly to termites, "or so-called White Ants," which attack the softer woods such as pine and, to a limited extent, redwood, and incidentally to the wood beetles which attack hardwood as, for example, maple or oak.

Timber is subject to the attack of numerous pests such as marine borers, fungus growths, and rot, but this attack is more or less in the open and controllable, whereas, the ravages of the termite are so insidious that often the first indication of their presence is a collapse of some portion of the structure. On the other hand, while the wood beetle is very unlikely to cause serious structural damage, it is rather aggravating to find hardwood floors or furniture reduced to dust. The termite works along the grain of the wood thereby providing passageways for his activities, whereas the wood beetle cuts across the grain of the wood remaining at the point of activity until it reaches maturity.

WOOD BECOMES POWDER

The wood beetles with which we have come in contact, such as the "Powder Post Beetle" and the "Death Watch Beetle," confine their attack almost entirely to the hardwoods, reducing them to a characteristic wood pow-

der. Their attack is entirely local and, since they spread very slowly, can usually be very easily controlled. However, very material damage may be done when they have been present in the wood for a long period of time.

Westminster Abbey, London, is an outstanding example where very serious damage was done by the "Death Watch Beetle." The hammer beam trusses and other structural framing were so badly eaten that very extensive repairs had to be made.



HE'LL GET YOU if you don't watch out. It's the Termite or so-called "White Ant" that is doing so much damage to buildings.

The adults are dark brown in color, about one-fifth inch or more in length, while the larvae are pale yellow in color and curled in shape. It is the larvae that do the damage to the wood. Each beetle has its own individual opening to the surface. Both the adult and larvae are a species of "Coelostethus," probably "Quadrulus."

The Powder Post Beetles belonging to the genus "Lyctus" are considered to be of the most economic importance. They can be eliminated by forcing Ortho or Parachlorobenzene into their workings through openings in the wood or by fumigation. A liberal application of pure kerosene oil is quite effective. Best results are obtained by removing infected wood and burning it.

EAT THROUGH TIMBERS

Contrary to popular belief, the small, blackish, white-winged insects swarming in large numbers in the Spring and Fall, after the first warm rains, are not ants or even distantly related to them. They will very prob-

(Continued on page 27)

What Makes the Wheels go Round?

Highly Organized Maintenance Shops

By AL BANKS, Assistant Deputy Director

FAR UP in the big hills, far out on the desert stretches and far along the broad thoroughfares of valley and coast, the motor vehicles of the Highway Division sing their song of unceasing activity. Anywhere and everywhere in the great State, the motorist meets them. These French gray machines travel far; and are work driven. Yet, always, they radiate power and purpose.

Four hundred and fifty passenger cars, eight hundred trucks and nearly two thousand pieces of equipment—these are some of



JUNK?—Well maybe it looks like it but the Highway Patrol won't be minus a car long—not after the boys at the Maintenance Shop get busy on "fixins."

the tools used by the brain and brawn of the Division.

Back of the efficiency of the motorized fleet are the mechanics of maintenance; and back of maintenance is a shop system.

BUSY AS BEEHIVES

The shop and the system are centered in the Headquarters Shop in Sacramento. Around it are grouped the shops of the ten divisions. In the Headquarters Shop there is service all the way from adjusting a carburetor to building a great forest fire fighting machine. The Sacramento Shop site comprises 117,500 square feet of space, of which 52,000 feet are under cover. It carries an annual pay roll of nearly a quarter of a million and hundreds of thousands of dollars in equipment purchases passed through the shop during the year.

The Headquarters Shop is something more

than a garage or repair station. It devises new tools for the road builders. It adapts or rebuilds equipment to suit their particular needs. It is a self-sustaining industry.

FIRE TRUCKS "DELIVER"

During the last 18 months the shop has built 25 motorized fire trucks, ranging all the way from the Ford type up to the heavy six-wheel Moreland. These trucks carry tanks of considerable capacity; their pumps are strong and they are equipped for every emergency. Speed and power, pressure and supply are combined to a marked degree. The power plants, the wheels and framework of the original trucks remain, but the whole purpose of the equipment has been made to serve the fire fighting service. The reconstructed trucks represent careful planning and expert mechanical service; and, best of all, those already in service have "delivered the goods" against the fire fiend of the hills.

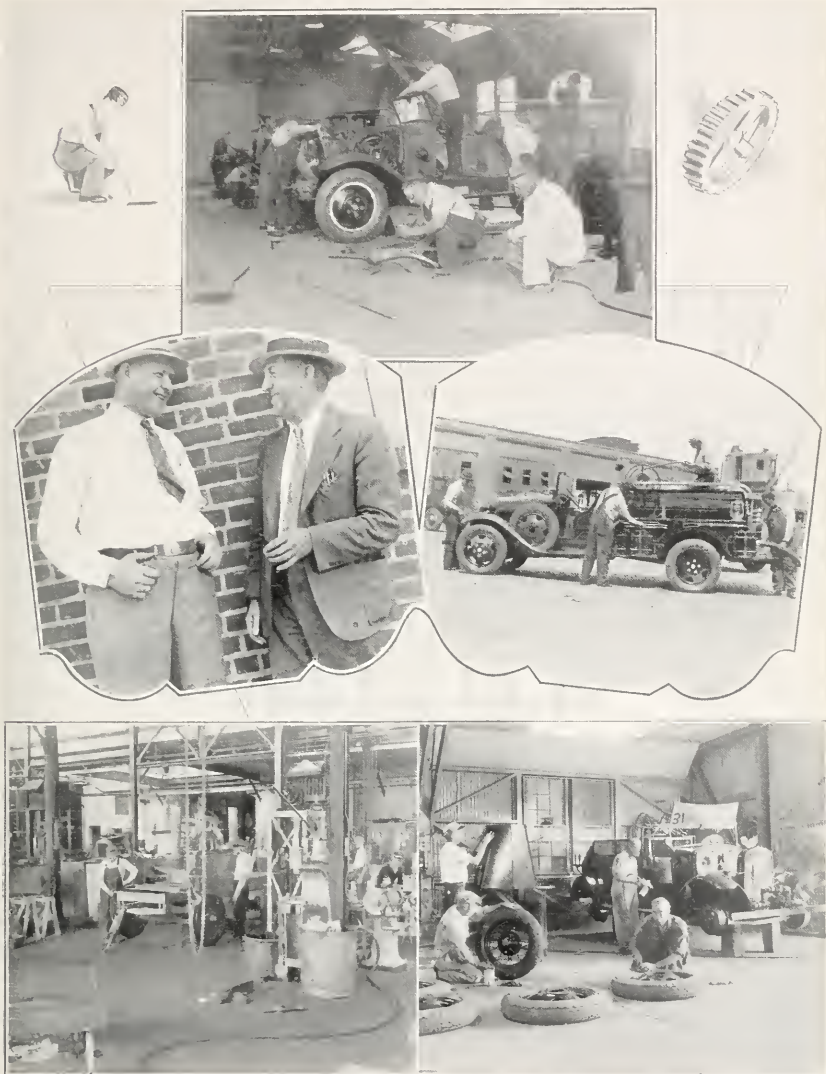
The Equipment Department or shop system had its inception at the close of the World War when the Federal government distributed vast quantities of motor vehicles and other



PRESTO!—Here it is, just like new and Inspector Morrison can not understand how 'twas done as he and Officer I. C. Kimball take delivery from Al Montijo.

road building equipment and supplies to the several states. The original cost to the government of the equipment distributed was approximately \$5,000,000. Much of it, however, was received in a used condition and its actual value at the time of delivery was much below the cost. During the time this stock was being distributed, the principal

(Continued on page 24)



VERSATILE THESE CHAPS—They'll fix your carburetor, build you a fire wagon, turn out a snow shovel or—what have you. The scenes are at the Sacramento Maintenance Shop. The top picture is a corner of one of the repair departments. Left center, F. E. Burnside, Superintendent, is telling R. H. Stalnaker, Equipment Engineer, that one about the Austin and the Buick. Next, a crew putting finishing touches to the twenty-fifth fire wagon built at the yards. Below, the heavy Equipment Shop, and right, the Paint Shop.

Federal Aid Money For Highways Paid When Work is Done

THE PREVALENT idea that Federal aid money for highways is an unconditional gift to the State is not true. The checks from Washington do not come in like Christmas gifts. The payments are on work already finished and paid for in the first instance by the State. They represent an approval payment on work initiated and carried through by the Highway Division under Federal approval. Always, the State must first earn the money by making its exhibit of work accomplished.

Up to August 1st of this year, the allocations of this fund to California had reached \$37,899,055, of which \$33,077,154 has been paid. Sometime in December, the balance, about \$4,500,000 is expected to reach the Division Treasury.

Federal aid for highways began in 1916 as a result of the government's recognition of the need of interstate and local roads for the movement of commerce in time of war. It was first predicated on the assumption of Federal interest in post roads, but was gradually developed to its present wide and liberal application. It was really not until 1921 that the system was raised to its present status of well defined policy and liberality.

Not alone the money, but the cooperation of the Federal engineers is invaluable to the great program. The coordination of Federal and State agencies is so well accomplished that their programs move in helpful unison.

STAKES OR STEAKS

This is just what happened, not so long ago, At the Highway Office, District I, you know.

The surveyors needed, stakes from redwood trees, (By the way, what others are as good as these?)

So phones Mr. Cramer to the Scotia Mill, "Have you any stakes there, and if so what will?"

"Just a minute, mister," comes back the reply, "We'll get you the butcher. He has a supply."

W.H.W.

The auto is a great moral force; it has practically stopped horse-stealing.

"You seem to have had a serious accident."
"Yes," said the bandaged person. "I tried to climb a tree in my motor car."


"What did you do that for?"

"Just to oblige a lady who was driving another car. She wanted to use the road."—*Wheel.*

By Poetry and Song He Moves Along, Does Chairman Earl Kelly

"WHICH three in that group of kids are our youngsters, dear?"

It's Earl Lee Kelly, talking to his wife. He's just returned from a highway tour as Chairman of the California Highway Commission.

And he's away from Redding so much since becoming a Governor  Ralph lieutenant that, with characteristic caution, he doesn't want to pick up and hug the wrong youngsters.

But seriously, Kelly is inspecting every mile of the California highway system and has covered more than half of it in seven months.

CARRIES FIVE SUITS


And his office force, running his private business for him, clocked him last month and found that he had spent 58 per cent of his working hours outside his office, busy in the affairs of his nonsalaried commissionership.

He's quite systematic in his travels. He carries at least five suits of clothes (who has five suits of clothes these days?) in a trunk on the back of his car and is quite an adept quick change artist.

Drives his own auto, mostly alone and composes his speeches while reeling off the miles. Loves poetry and generally, unless restrained by his friends, manages to inject two or three into every speech he makes.

PIPE THE PANTS

Is an ornament to the Rotarians because he's a singer and all Rotarians love to sing—or sing at something. He has an eight years' perfect membership in the Rotary Club.

And all the above is the peg  upon which to hang the picture on the opposite page, taken of Mr. Kelly when he was quite, quite young and a student at U. C., pants and all. This snapshot was stolen in true "yellow journal" style by a certain Shasta County politician and "sold" in true Scotch style to the editor as a "scoop" of the first water and importance.

Automobiles in unfit mechanical condition for driving are being removed from the highways of Delaware. By direction of the Secretary of State and the Delaware Safety Council, a greater part of the registered automobiles in the state were inspected and a warning issued that all drivers of cars not displaying the official windshield sticker of inspection will be stopped by the traffic officers.



HE WAS IN THE
U. C. GLEE CLUB,
CLASS OF 1915



HE ALSO TOTTED
THE BALL A BIT



Then...



WHAT A MAN he was in those days with the peg top college pants and all. It's the dignified and distinguished Earl Lee Kelly, Chairman of the California Highway Commission, the snap being taken many years ago. Mr. Kelly is traveling over every mile of State Highway and will then begin on county roads. He was once Mayor of Redding and has a host of friends in Northern California. As a poet his acquaintances declare he's a good singer.



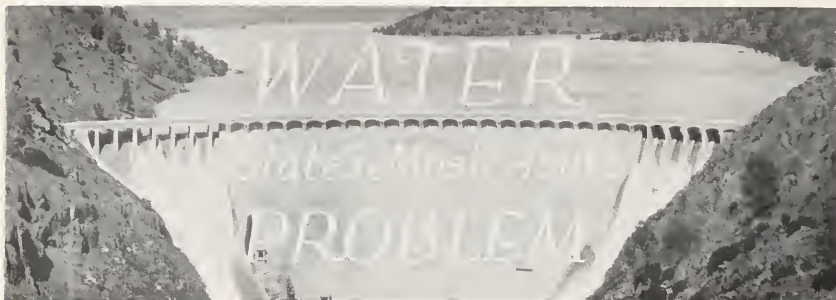
THE NUMBER AND
VARIETY OF HIS
SUITS AMAZE THE
WORLD

THAT REMINDS ME OF THE
IMMORTAL WORDS...
"YOU TAKE THE HIGH ROAD..."



HE WORKS A POEM
OR TWO INTO EVERY
SPEECH





This is the second of a series of articles on the State's water problem. The first article, printed in last month's issue of *California Highways and Public Works*, dealt with the Governor's call to the citizens of the entire State to unite for a successful solution of the problem. This article deals with the Sacramento Valley and Sacramento-San Joaquin Delta situation. Like analyses will follow.

The Sacramento Valley and the Sacramento-San Joaquin Delta comprise the northerly part of that extensive mountain-girdled area known as the Great Central Valley of California. Due to favorable climatological conditions throughout the Sacramento Valley, dry farming has been more successfully carried on in the past than in the San Joaquin Valley and southern California. However, during the past two decades the irrigated area has greatly increased, and nearly 500,000 acres have been added to the irrigated acreage.

A great variety of crops are now produced in the Sacramento Valley. Many thousand acres of barley, wheat and oats are grown. In a great deal of the valley and foothill area conditions are especially favorable for growing many kinds of fruit. Peaches and pears are produced in large quantities. Thermal belts make possible the production of sub-tropical fruits including oranges, lemons and grapefruit. Almonds, prunes, vegetables, sugar beets and alfalfa are also important crops. The diversity of crops is indicative of the fertile soil and equable climate.

RECLAMATION AREA

The Sacramento-San Joaquin Delta is a reclaimed area of wonderfully productive soil; a vast vegetable garden with almost every known American vegetable, produced in immense quantities to supply the nearby markets and canneries. Ninety-five per cent of the world's supply of canning asparagus is grown in the delta.

The water problems of these two regions are closely related, as a large part of the water supply of the delta comes from the Sacramento River. During the past decade, in its investigation of the water resources of the State, the Division of Water Resources has made an inventory of all the waters within the State. In this work, committees of eminent consulting engineers familiar with the water problems of the Sacramento River Basin and the Sacramento-San Joaquin Delta have given their advice in outlining the investigations and have given their counsel on all phases of the problems. During the past two years the members of the committees were, G. A. Atherton, B. A. Etcheverry, J. D. Gallo-way, H. L. Haehl, F. C. Herrmann, W. L. Huber, J. B. Lippencott, T. H. Meaus and F. H. Tibbetts.

The mountainous drainage area of the Sacramento River Basin contains 21,369 square miles and contributes 34.8 per cent of the stream flow of California. In determining the water supply of the Sacramento Basin, study was made of a forty-year period from 1889 to 1929. This period starts with several wet years, contains both wet and dry cycles and including one of the longest and driest cycles of record. The mean seasonal run-offs are estimated to be as follows:

	<i>Acres-feet</i>
40-year mean—1889-1929.....	24,801,000
20-year mean—1909-1929.....	20,593,000
10-year mean—1919-1929.....	17,920,000
5-year mean—1924-1929.....	19,027,000

(Continued on page 20)

“State Water Problem Still Needs Adequate Broadcasting”

From San Francisco Chronicle, September 1st

THE GOVERNOR'S State-wide Water Committee has before it and within its powers the first essential before any positive action can be expected on the water question. This is to make the people of California realize their interest in action.

The facts in the California water problem are clear. The State has a good deal of water—but not in the right places. In some parts of the State is more water than is needed—in other parts not enough. Three-fourths of the State waters, to quote from the Governor's message, lie within the northerly third of the State, while three-fourths of the ultimate demand lies in the southerly two-thirds of the State.

Irrigation now absorbs the summer flow of the streams of southern California and of those entering the San Joaquin Valley. Irrigation from wells in both southern California and in the San Joaquin Valley has in many places lowered the underground supplies below the pumping limit. Irrigation absorbs the summer flow of the rivers entering the Sacramento Valley to an extent that barely leaves enough for navigation of the Sacramento River and not enough to prevent encroachment of ocean brine on the Suisun Bay towns and industries and on the farm lands of the river delta.

Most of these rivers run high in winter and spring with water which wastes to the sea. This is especially true of the Sacramento-American-Yuba-Feather-Pit system, which is the big river layout of California, with the watershed of most rain and snowfall.

The problem is to hold these winter and spring floods and distribute the water throughout the summer where it is needed. Schemes have been proposed to put storage dams on all these rivers. This would be ideal but is a large order at the moment. Besides, many or most of these streams offer no suitable reservoir sites over and above the ones now utilized by dams.

The largest unit of all, likewise the one with the greatest storage possibilities, is the Sacramento-Pit system, which now has no storage reservoirs. It is obviously the one for the first reservoir, the river on which the

most water can be stored for the money. After that probably comes the American River. At the southern end of the State the Hoover Dam will create an immense supply, which has only to be conveyed across the thirsty cultivated slope on the ocean side.

These are elements of the situation which are easily seen by anyone who will look around.

The problem now before the State is not to find these facts. It is to make the people of California understand the vital need of handling these facts to put the surplus waters to work where the lands are now going dry. Only a minor part of the population of California now realizes the case. This is composed principally of the people of the districts directly affected. They know. But the greater part of the citizenry of California either does not know or imagines it is not affected. Everyone in California is vitally affected, but it will take some work to get that fact home.

The Governor has appointed a very large and very representative advisory committee. For any ordinary purpose this committee would be too unwieldy. But for the first object confronting the State—to wake the people to the importance of prompt action—this body seems excellent. Individually its members have an opportunity—and a duty—to spread knowledge of the water problem and the pressing need of action.

TO BEAUTIFY ROADS

Beautification of 28 major boulevards in Los Angeles and vicinity is announced by the Division of Forestry of the Los Angeles County Park Department. The program calls for the planting of 26,135 trees within the next three months, which will mean the beautification of nearly every main thoroughfare leading into the metropolis. Such action will further beautify the highways for the 1932 Olympic Games visitors. Tens of thousands of these will come from Europe, where highway beautification is made a study, and their reaction to California's beauty doubtless will be influenced by the appearance of its roadsides.

Signboard at a railroad crossing: Go on and take a chance. You're unimportant.—*Exchange.*

“Officer—“What do you mean, young lady, driving down the street at fifty miles an hour?”
Sweet Young Thing—“Oh, sir, you must be mistaken—I only left the garage half an hour ago.”

Three Shifts Moving Telephone Cables To Permit Bridge Boring in October

THREE shifts of men, working night and day since June 30th on the emergency job of moving twelve huge telephone cables out of the path of the San Francisco-East Bay Bridge, are advancing with swift precision toward the goal set for September 30, when the work is to be completed.

"Seven down and five to go." That, in the language of golf, is the score in this difficult, somewhat spectacular game which these thirty-three men of The Pacific Telephone and Telegraph Co. are playing, if one of the most difficult jobs in western telephone history may be called playing, out in San Francisco Bay.

These three squads of men are right on schedule at the present writing. Seven cables have been cleared from 15 feet of mud at the bottom of the bay, lifted 100 feet to the surface of the water, and shifted 1000 feet north of the route held by telephone lines for nearly a half century.

As a result, unless unforeseen difficulties spring up between now and the end of September, the path of the great bridge will be cleared, ready for the next move in the work of erecting the \$75,000,000 structure, and completing it in 1937. This next move is the

start of borings for the bridge foundations. Borings will begin in October.

The ninety-day task has thus far lived up to the telephone company's expectation that it would be an extremely difficult one and that every precaution should be taken to prevent interruption to the telephone service

of a million and a half people in the bay area. Extreme care taken in planning and executing the work resulted in only two of the seven cables giving serious trouble when they were raised and moved under a strain for which they were not designed. Minor injuries to several other cables came at such times and in such ways as to cause little difficulty.

1200 WIRES IN CABLE

Of the two cables giving serious trouble, one was the largest size submarine cable now in use, carrying in its 1200 wires a peak capacity of 60,000 words a minute. All lines put out of commission by the two breaks were replaced in from fifteen minutes to

about an hour by hooking up spare "stand-by" wires held for such an emergency in other of the twelve cables, while repair crews, working through flood and ebb tides, had the voice ways mended with as little delay as possible.

When the huge 1200-wire cable went out, diver William Reed was prevented for four

BRIDGE BOARD TO MEET

TO DISCUSS the San Francisco-Oakland Bay Bridge and the controlling factors in the design of the structure, the Consulting Engineering Board will meet during the first week in October.

The conference will be held at the San Francisco bridge headquarters which were opened the middle of September.

The Consulting Board is being called together by Charles H. Purcell, State Engineer. It is composed of the following men, eminent in their profession:

Chairman, Ralph Modjeski of New York City; the firm of Moran & Proctor, Foundation Consultants, New York City; Leon S. Moisseiff, Consulting Structural Engineer; C. Derleth, Jr., Dean of Engineering at the University of California; H. J. Brunner, Consulting Engineer, San Francisco; Charles E. Andrew, State Bridge Engineer, and Charles H. Purcell.

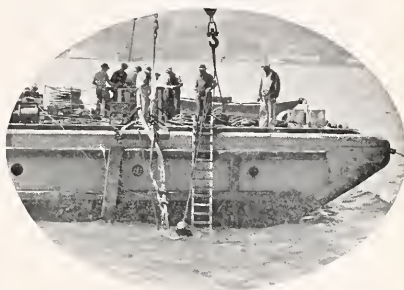
BORINGS IN OCTOBER

Hero of War Works On Bottom of Bay Moving Big Cables

hours from descending to the bottom of the bay to locate the trouble, because of a swift tide racing past the telephone company's barge "Pacific," the "flagship" of the telephone fleet of five large and five small boats used for the cable moving.

Reed is a war hero. As a member of a squad of divers in the World War he went out from New York and repaired a hole in the side of a hospital ship returning from France with wounded soldiers. The ship had been rammed by another vessel. Reed

LINE'S BUSY



QUICK SERVICE—The Telephone Company putting finishing touches to a big job of moving phone cables out of the way of the Bay Bridge. At top, Diver William Reed (see the top of his helmet in the water) receiving telephoned instructions from Construction Superintendent F. O. Edmunds on the barge. And below, Edmunds has hooked up on a cable being spliced, to talk with headquarters ashore from the middle of San Francisco Bay.

also helped in the raising of the American submarine S-51, which sank off Providence, Rhode Island.

Down in the captain's cabin of the telephone barge, a large chart shows the telephone cables between San Francisco and Yerba Buena Island. These are the lines now being moved and Division Plant Manager E. E. Perkins and Division Construction Superintendent F. O. Edmunds watch with satisfaction as small colored wires, representing the cables are moved on this chart,

until now seven have been transferred, with five to go.

MUST DECLARE RADIOS

Motorists with radios attached to their cars must announce this fact to customs officers in going into Canada, and also pay a fee of \$1, according to an announcement by the Touring Bureau of the Automobile Club of Southern California. The fee is required for all radios in the northern country. It may be paid through postmasters in the larger cities and towns. After touring Canada, motorists should call attention to the radio so that it may be checked off their customs permit.

Proposals Asked for Investigating Foundation Sites for S. F. Bay Bridge

SEALED proposals will be received at the office of the Chief Engineer of the San Francisco Bay Bridge, 500 Sansome street, San Francisco, California, until 2 o'clock p.m., on October 7, 1931, at which time they will be publicly opened and read, for investigating the foundation sites for the San Francisco Bay Bridge, in accordance with the specifications therefor, to which special reference is made as follows:

Performing all necessary work and furnishing materials and equipment for investigating foundation sites for the San Francisco Bay Bridge consisting of diamond drill and jet borings, driving casings and test piles and loading piles with test loads.

HERE IS ESTIMATE

The Chief Engineer's estimate follows:

- | | |
|---------|--|
| Item 1. | 1550 lineal feet diamond drilling through bedrock. |
| Item 2. | 5000 lineal feet jet drilling from mean high water to bedrock. |
| Item 3. | 3300 lineal feet dry sample holes through 8-inch casing (casing to be furnished by the State). |
| Item 4. | 1 only, 9-pile cluster, loading platform and loading material. |
| Item 5. | 1 only, 42-inch diameter steel cylinder and one timber pile driven inside cylinder and loaded. |
| Item 6. | 2 each, timber piles driven to thirty (30) ton bearing capacity and loaded. |
| Item 7. | 2 each, timber piles 110 feet long, driven and loaded. |

The State will furnish casings as more explicitly set forth in the special provisions.

RIGHTS RESERVED

The foregoing quantities are approximate only, being given as a basis for the comparison of bids and the Department of Public Works does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work as may be deemed necessary or expedient by the said Department of Public Works.

All bids are to be compared on the basis of the Chief Engineer's estimate of the quantities of work to be done.

In accordance with the provisions of Chapter 397, Statutes of 1931, the State has ascertained the general prevailing rate of wages applicable to the work to be done, which list may be obtained, together with plans, forms of proposal, bonds, contract and specifications at the office of the State Highway Engineer, Sacramento. They also may be seen at the office of the Chief Engineer, 500 Sansome street, San Francisco, and at the office of the District Engineer of the Division of Highways at Los Angeles; and at the office of the Associated General Contractors in San Francisco.

MUST BE LICENSED

Proposal forms will be issued only to those contractors who have furnished a verified statement of experience and financial condition in accordance with the provisions of Chapter 644, Statutes of 1929, and whose statements so furnished are satisfactory to the Department of Public Works.

Bids will not be accepted from a contractor who has not been licensed in accordance with the provisions of Chapter 791, Statutes of 1929, or to whom a proposal form has not been issued by the Department of Public Works.

A representative of the Chief Engineer will be available to accompany prospective bidders for an inspection of the work herein contemplated and contractors are urged to investigate the location, character and quantity of work to be done, with said representative. It is requested that arrangements for joint field inspection be made as far in advance as possible.

FORMS FURNISHED

No bid will be received unless it is made on a blank form furnished by the Chief Engineer. The special attention of prospective bidders is called to the "Proposal Requirements and Conditions" annexed to the blank form of proposal, for full directions as to bidding, etc.

The Department of Public Works reserves the right to reject any or all bids.

Gasoline tax receipts amounted to \$22,110,961 in the United States in 1930, as compared with \$448,183,249 in 1929 and \$318,041,556 in 1928.

All Roads Will Lead to California For Olympiad; 250,000 Cars Expected

Phew! Winter may be coming and the vacation season going but—

When one reads of the beauties of California seen along the numerous fine highways of the State, the urge to crank up the old car and hie out is on again. Scenery, romance, history—all touched upon in this article showing California's road preparation for the Tenth Olympiad at Los Angeles. And written by an engineer who, should he tire of building highways, seems well qualified for the Tourist Bureau or some other booster organization.

By G. T. McCOY, Principal Assistant Highway Engineer

THE WATCHWORD of the Caesars in 32 A. D. was "All roads lead to Rome." In 1932 the watchword of the world will be "All roads lead to California and the Tenth Olympiad in Los Angeles."

From July 30 to August 14, 1932, the world of amateur athletics will trek to the City of the Angels to witness the competition in this ancient classic performed beneath the sunny skies of California's southland.

In 1932 California expects to entertain fully three times the normal number of an-

DON'T KID McCOY on highways of California. He knows 'em from end to end. In the picture he's thinking of a real good boost thought for the next paragraph of the accompanying story.

nual visitors. This will mean that approximately two hundred fifty thousand foreign cars, carrying some seven hundred fifty thousand tourists, will come to California during the year of the Olympic Games.

NETWORK OF ROADS

To greet this caravan of thousands, California will spread before them a network of smooth, easily traversed highways, the main stems and laterals of which comprise the State highway system.

The forward-looking program of the Division of Highways has pushed construction on transcontinental routes and connecting roads within the State that they might be in excellent condition to care adequately for the increased traffic of 1932.



A comprehensive report of the improvements and proposed condition during the summer of 1932 is not the purpose of this article, but rather to place before the reader a panorama of the routes within the State highway system which lead into Los Angeles, with brief statements as to the type and condition of each.

Los Angeles is approached by modern highways which fan to all parts of California. On

Many Routes Open for Olympic Games

(Continued from preceding page)

any angle of approach the motorist will find wide, smooth, paved or surfaced roads through the entire State leading to the metropolitan center of southern California.

The most southerly route from the eastern states into California is the transcontinental highway, U. S. Route 80, from Savannah on the Atlantic seaboard through Shreveport, Dallas, El Paso and Phoenix to the California line at Yuma. Within California this route is in excellent condition. It passes from the crossing of the Colorado River at Yuma to the heart of the fertile Imperial Valley at El Centro. The highway is entirely paved and surfaced over this portion of the route with Portland cement or asphalt concrete or with bituminous treated crushed rock. Between the State line and El Centro two contracts covering 28 miles of asphalt concrete surfacing are now speeding towards completion, and a third, 6 miles in length, has just been completed.

VARIETY OF SCENERY

At El Centro the motorist has a choice of two routes on State highways into Los Angeles. The one, along the Mexican border to San Diego and thence northward along the coast, is a wide, smooth pavement throughout its entire length and presents a variety of scenery as well as the opportunity for a stop at California's most southern seaport—beautiful San Diego. The alternate route is more direct and traverses the desert east of the coastal range to San Bernardino. This road is also paved throughout its length and presents long stretches of straight highway with minimum grades.

Entering California by way of U. S. Route 66, which extends from Chicago through St. Louis, Tulsa and Albuquerque to Needles, the motorist will cross the southeasterly portion of the Mojave Desert with its captivating mystery of iridescent color on one of the finest desert highways in the West. During the past three years construction has been carried eastward on this route from San Bernardino. The construction of the last two unimproved sections, covering the 30 miles from Essex to one mile south of Klinefelter, now under construction, and the eight-miles between Devore and Alray, just south of Cajon Pass, which will be built this year, will bring this road to modern standards. This

desert highway has a roadbed width of 36 feet with a surface of bituminous treated crushed rock 20 feet wide.

MODERN STANDARDS

Connecting with U. S. Route 66 at Barstow is U. S. Route 99 which comes from Salt Lake City by way of Las Vegas, Nevada. In California, this road is a unit of the State system and has been brought to modern standards over nearly its entire length. Of the 118 miles between the State line and Barstow, 81 miles have been completed to modern standards or are now under construction. The same types of high grade desert construction have been used on this highway as have been so successfully used between Needles and San Bernardino.

Arriving at San Bernardino by one of the three routes above described, the State highway system offers the choice of two routes over the 70 miles into Los Angeles.

One is the Foothill Boulevard, which skirts the base of the Sierra Madre through Glendora and Monrovia to Pasadena. The other State highway lies a few miles to the south and passes through Pomona directly into Los Angeles.

BEAUTIFUL HOMES

Both of these routes are fast traffic boulevards with wide pavements of the highest standards. They pass through the very heart of the southern California citrus section and present the tourist with views of beautiful homes set among orange groves with purple ridges of lofty mountains to the north as a background.

The visitor to California, traveling over the southern route may, upon reaching Phoenix, Arizona, elect to reach the California line at Ehrenberg and cross the desert via the Blythe-Mecca lateral which connects with the El Centro-San Bernardino road north of the Salton Sea. This State highway is a good desert road with the 50 miles west of Blythe of modern construction having a bituminous treated crushed rock surface 20 feet wide.

The visitor, laying his course to the Olympic Games by way of San Diego, has a drive of 135 miles from San Diego to Los Angeles which is rich in beauty and historical interest.

From San Diego to San Juan Capistrano the State highway skirts the shore of the blue

Romance, Beauty, History on Highways

(Continued from preceding page)

Pacific following "El Camino Real" where, in the days of Spanish California, the sandaled feet of Franciscan Padres trekked the day's journey from one mission to another. This route is another of California's intercity boulevards, of which the State is justly proud. Paved with Portland cement or asphalt concrete, from 20 to 56 feet in width, with long radius curves and easy grades, this highway makes a delightful finale to a trip to the Pacific Coast.

Recent construction on this route has been of considerable aid in maintaining it to the highest standards and includes the construction of several grade separations, the new reinforced concrete bridge across the San Luis Rey River at Oceanside, the construction and paving of the Rose Canyon cut-off at the northerly city limits of San Diego and a large paving contract, now under way, between San Mateo Creek and Serra, in Orange County.

ROMANCE OF GOLD

An interesting approach to Los Angeles through central Nevada may be made by way of Reno and Carson City, entering California through West Walker Pass, north of Mono Lake. Or the entrance to California may be made through the old gold mining centers of Nevada, in the vicinity of Tonopah, by way of the Montgomery or Westgard passes south of Mono Lake.

All these approaches bring the motorist over improved roads into the long Owens Valley where they connect with the splendid State highway which runs the length of this valley and passes through the grotesque Red Rock Canyon into the northerly end of the Mojave Desert. This highway then circles the Tehachapi and connects with the central artery of the State highway system at Saugus, a few miles north of Los Angeles. Through the Owens Valley and as far south as Mojave this route is of recently constructed bituminous treated crushed rock. From Mojave to Los Angeles the highway is paved with Portland cement concrete.

From the eastern and middle western states the Lincoln Highway extends from Washington D. C., via Cincinnati, St. Louis, Kansas City and Pueblo through the Rockies to Salt Lake, thence to Carson City and into California along the south shore of azure Lake Tahoe.

Within California this route passes over the Sierra Nevadas at Echo Summit and drops down their western slopes through the beautiful canyon of the South Fork of the American River to picturesque Placerville, the historical old "Hangtown" of gold rush days in California, and thence over the broad Sacramento Valley to Sacramento, where it joins the smooth ribbon of the Golden State Highway which connects the State Capital with Los Angeles.

From the State line to Placerville this route has, within the past few years, been constructed to modern standards of mountain highway construction with a wide roadbed surfaced with bituminous treated crushed rock 18 to 22 feet wide.

ANOTHER POPULAR ROUTE

Between Placerville and Sacramento the road is paved with Portland cement and asphalt concrete.

The most popular northern route into California is over U. S. Route 40, the transcontinental highway from Baltimore via Columbus, Indianapolis, St. Louis, Kansas City, Denver, Salt Lake and Reno. This route enters California via Truckee just to the north of Lake Tahoe and crosses the Sierras over the beautiful Donner Summit. From here it winds down the western slopes of timber clad mountains, the finest of California's mountain highways, reaching Sacramento via Auburn.

The past several years have seen large reconstruction projects change this road from the winding wagon trail of the early fifties to a modern high-speed mountain highway. Seven railroad grade crossings have been eliminated and the road reconstructed on new alignment between the airport west of Emigrant Gap and Soda Springs, and new surfacing or pavement has been or is now being placed between Truckee and Hinton, Colfax and Gold Run, Newcastle and Auburn, Roseville and Rocklin and Sacramento and Sylvan School.

Some of the more adventurous tourists may elect to come to California via Yellowstone National Park. From the park the most direct route to this State is through Twin Falls, Boise and Ontario, entering California through Fandango Pass east of Alturas.

(Continued on page 26)

U. S. Officials will Attend Conference Here on October 28

(Continued from page 4)

all western states, has been increased to even a greater extent.

Through the action of the Association at the Denver meeting the publication of Miscellaneous Publication No. 103 of the U. S. Department Agr. (Summary of Irrigation District Statistics of Western States) was made possible and expedited in such way as to make it available to the recent sessions of the Congress and State Legislatures.

OFFICIALS TO ATTEND

Attendance of Dr. Elwood Mead, U. S. Commissioner of Reclamation, Vice Chairman Ralph P. Williamson of the Federal Power Commission, and Lieut. Col. Thos. M. Robins of the U. S. War Department, at the Sacramento meeting, and their participation with State representatives in the discussion of Federal and State policies with respect to reservoirs, power development, flood control, and navigation, gives promise of a particularly interesting and informative program on the opening day of the Conference.

Meetings of the Association are open to the public and in addition to the members and many Californians who have already indicated their intention to attend, there is the possibility of attendance by officials from some of the eastern states who are interested in the work of the Association.

Provision is being made for the entertainment of the wives of visiting delegates and guests, and Sacramento Section of the American Society of Civil Engineers will entertain at a dinner and social evening on Wednesday, October 28th. A motor trip as guests of the Pacific Gas & Electric Company is planned for Friday afternoon and Saturday, October 30th and 31st.

The officers of the Association are:

Edward Hyatt, State Engineer of California, President; George M. Bacon, State Engineer of Utah, Vice President; and Everett N. Bryan, Hydraulic Engineer of California State Division of Water Resources, Secretary. The Executive Committee is composed of the President, Vice President and Junior Past President M. C. Hinderlider, State Engineer of Colorado.

Pessimism Jolted By Great Success Of 1931 State Fair

PESSIMISM surely received a jolt when the State Fair of 1931 passed into history as one of the most successful in a half century of the institution. Animated Californians and out-of-state visitors thronged the grounds by the tens of thousands.

The big show was excellent in every department. The stock and agricultural features were aggressively prominent, but the manufacturers and commercial interests spread their wares most attractively. Informative displays and good salesmanship will undoubtedly return dividends.

ALL ARE REPRESENTED

Practically all departments of the State government were represented. The object was to bring to the people information as to the character of service being performed, and to encourage them in a more general use of the services which the State has in operation for their material and social welfare.

The Department of Public Works, embracing the Divisions of Highways, Architecture and Water Resources, had a large booth in the Western States Building. It was visited by thousands. The minimum estimate was 20,000.

MAP DRAWS CROWD

The walled enclosure, scenically decorated and with four entrances, was located at the main entrance. In the center was a topographical map showing the highways, location of State institutions, county lines and waterways. It was a real center of attraction. This map—nearly 40 feet in length—brought home to visitors the magnificent expanse of the Golden State and proved to be one of the features of the Fair.

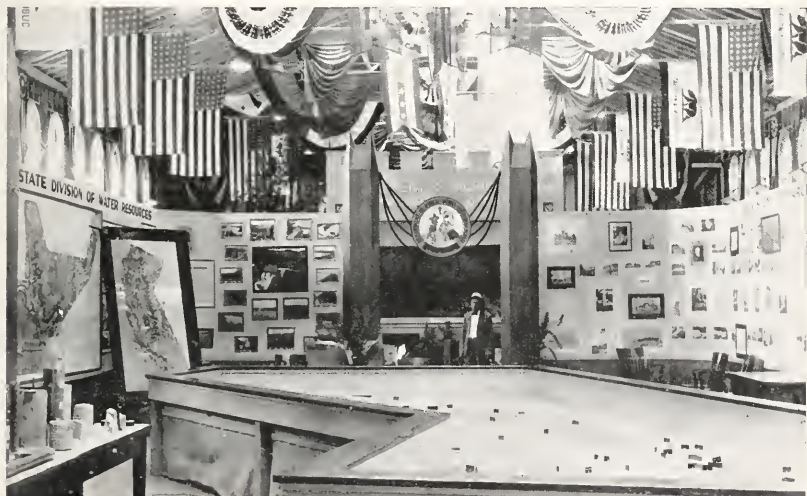
The interior walls of the booth were pictorial. Photographs of highways completed and under construction featured the Highway Section. The Architecture Section showed State institutions, and the Water Resources pictured everything from irrigation scenes up to the Hetch Hetchy dams. Many of the photographs were colored and framed.

Headquarters Shop activities were shown in pictures, laboratory work in exhibits of test results, and financial phases of the great department's work in statistical statements in concise form. A large topographical map of the State showing the State-wide Water Plan was under examination all day long.

Many a man who is a five-ton truck at the office is nothing but a trailer at home.—*Motor Land.*



CALIFORNIA AT A GLANCE attracted considerable attention at the State Fair. Despite the fact the Department of Public Works lost practically all its exhibit material during the recent fire on the grounds, a highly creditable exhibition was prepared for the recent exposition. A large relief map, showing the mountains, rivers, lakes, highways and towns of this State, was the magnet for thousands. The astonishing feature was that the majority of those inspecting it were adults. This photograph shows the map and a section of the exhibit devoted to the Division of Highways.



IN THIS CORNER the Division of Water Resources on the left and that of Architecture, on the right, gave visual proof of the important work being done by these branches of the Department of Public Works. With maps, photographs and statistics these divisions told their story of achievement to multitudes that daily thronged the joint exhibits at the Fair.

Sacramento Valley Problem Analyzed

(Continued from page 10)

The uses of water in the Sacramento River Basin include those for municipal and domestic supplies, irrigation, industrial use, power development, navigation, the prevention of invasion of saline water into the delta, hydraulic mining and recreation. Of these, the use for irrigation purposes does, and probably will continue to predominate, and has, therefore, been used as the basis for estimating the water requirements of the basin.

In order to determine the ultimate requirements of the Sacramento Valley and the Sacramento-San Joaquin Delta, a classification survey was made of all lands in the valley and adjacent foothills to determine their adaptability for irrigation. More than merely a soil survey, the classification considered the effect of topography, alkali, and soil texture on the probable use of water on the land. Nearly nine million acres were classified, and from this work the net areas of irrigable lands in the valley and foothill areas and mountain valleys were determined. Of the 6,435,000 acres of agricultural lands, there is a net irrigable area of 4,266,000 acres that may at some time require a water supply. In comparison with this only 1,076,000 acres including the mountain valleys were irrigated in 1929.

WATER ESTIMATED

At the same time that the land classification was being made, a crop survey was carried on to determine the areas most suited for various crops. Estimates then were made of the areas which might ultimately be planted to certain crops or groups of crops. Water requirement for each crop was determined, both the amount of water actually used and the amount which it would be necessary to divert to supply this use.

By these means an estimate was made of the total amount of water required for each section of the Sacramento River Basin including the delta.

In addition to the water required for consumptive use in the delta, a sufficient supply of water flowing into Suisun Bay must be provided in order to repel the effect of tidal action in advancing salinity. In order to limit the increase of salinity at Antioch to a mean degree of not more than 100 parts chlorine per 100,000 parts of water, with decreasing salinity upstream, the annual amount of water required would total 2,390,000 acre-feet. This would be made up in large part from waste waters.

The ultimate annual gross water requirements for the Sacramento River Basin and Sacramento-San Joaquin Delta including requirements for salinity control would amount to 15,864,000 acre-feet.

STATE WATER PLAN

The State Water Plan for ultimate development of water resources of the Sacramento River Basin includes construction of ten reservoirs in the basin and one on Trinity River with a diversion from this stream to the Sacramento Valley. The operation of these reservoirs for flood control is contemplated in the State Plan, and would not materially impair their value for conservation purposes, nor materially decrease the amount or value of the electric energy generated by water released from them. An increased degree of protection to the areas subject to overflow, particularly those within the Sacramento Flood Con-

trol Project, and a substantial reduction in flood flows with decreased potential annual flood damages would result from the operation of these reservoirs for flood control.

In order to determine the amount of surplus water available in the Sacramento River Basin under conditions of ultimate development, a study was made covering the driest period of record, that from 1918 to 1929. Operations of all ultimate major units of the State Plan in the Sacramento River Basin were coordinated for several purposes: regulation of run-off to meet irrigation demands, reduction of flood flows, improvement of navigation and control of salinity.

HERE ARE RESULTS

The results of coordinated operation of these units shows the following results would have been accomplished:

1. A full and dependable supply would have been made available for the irrigation of every acre of irrigable land in the Sacramento Valley, foothills and mountain valleys.
2. Flood flows would be reduced from one-quarter to one-half at the dams.
3. Navigation would have been improved on the Sacramento River.
4. There would have been an annual flow into the delta of 6,000,000 to 15,000,000 acre-feet per year, depending upon the season, which would be more than sufficient for full use on the delta lands, and control of salinity to harmless amounts at the lower end of the delta. After supplying all these needs, there would have been a minimum surplus available in the driest year of 2,000,000 acre-feet and an annual mean surplus of 6,000,000 acre-feet for beneficial uses.

SALINE WATER INVASION

The most important water problem in the Sacramento River Basin is the invasion of saline water into the upper San Francisco Bay and delta channels. In addition to this, the increased irrigation development has caused such heavy drafts on the rivers during the summer months that navigation has been hampered and in some years there has been a serious shortage of irrigation water. All these problems, salinity control, navigation and deficiency in irrigation supply along the Sacramento River are closely allied.

The State Water Plan proposes for initial development in the Sacramento River Basin the construction of the Kennett Reservoir. The Kennett Dam would be 420 feet high, creating a reservoir of 2,940,000 acre-feet capacity. The estimated cost, including an afterbay and power plants is \$84,000,000. This is the most favorable and economic unit of the State Water Plan in the Sacramento River Basin adjudged feasible of construction when consideration is given to the number and extent of the benefits that would result from its operation.

CONTROL FLOODS

The reservoir could be operated to attain the following accomplishments:

What State Water Plan Proposes for Sacramento Region

1. Control floods in Sacramento River to 125,000 second-feet mean daily flow on day of flood crest, measured at Red Bluff, exceeded once in fourteen years on the average. The controlled flow exceeded once in 100 years on the average would be 187,000 second-feet, due to the uncontrolled run-off between Kennett Reservoir and Red Bluff. Flood flows in excess of 125,000 second-feet would be of short duration.
2. Maintain a navigable depth in the Sacramento River of five to six feet from the city of Sacramento to Chico Landing, with a substantial increase in depth from the latter point to Red Bluff.
3. Furnish in the Sacramento River an irrigation supply for the lands above Sacramento, without deficiency, up to 6000 second-feet in July, thus furnishing a supply in all years to all lands under irrigation along the Sacramento River above the delta. There would have been over 700,000 acre-feet more water available for these lands in 1924.
4. Furnish an irrigation supply, without deficiency, for the present requirements of the Sacramento-San Joaquin Delta.
5. Control salinity to the lower end of the Sacramento-San Joaquin Delta by release of water to maintain a fresh water flow past Antioch into Suisun Bay of not less than 3300 second-feet.
6. Make available in the delta a water supply, without deficiency, for the developed industrial and agricultural area along the south shore of Suisun Bay in Contra Costa County.
7. Make available an irrigation supply, without deficiency, in the delta sufficient in amount to fully supply the "crop lands" now being served from the San Joaquin River above the mouth of the Merced River. This would be conveyed to these lands by the San Joaquin River pumping system and would make possible the exportation of all the available supply in the San Joaquin River at Friant. This is not believed essential as an immediate step.
8. Generate 1,581,100,000 k.w. hours of hydroelectric energy per year on the average incidental to other uses, the sale of which would help defray the cost of the unit.

U. S. TAKES HAND

An independent investigation of the Sacramento, San Joaquin and Kern rivers, California, covering navigation, flood control, power development and irrigation is being made by the United States War Department. A partial report was submitted to Congress in February, 1921, and a complete report is expected to be submitted soon after Congress convenes in December. In the partial report, Major General Lytle Brown, Chief of Engineers, recommends that the Federal government contribute \$6,000,000 to the construction of Kennett dam in the interest of navigation.

The State's investigation has been made by the Department of Public Works, Col. Walter E. Garrison, Director, under the general direction of State Engineer, Edward Hyatt. The investigations have

HERE'S UNSUNG HERO! HE'S THE MAN DOING JOB OF MAINTENANCE

THE FOREST ranger, and the Canadian mounted police are lauded alike in printed romance and the silver screen, but there remains one hero of the west who is unsung. This is the highway maintenance workman, and he has a rough, dirty and unpleasant job. His work, often at inconvenient hours, many times is dangerous. When a road is washed out, day or night, he must be on deck working like mad that traffic may continue next day. Snowslides, cloudbursts, windstorms, or extremely high temperatures, find the workmen guarding and repairing your road. The sentinel waving the lantern late at night, the gang deep in the water of a swollen wash holding a bridge, the grimy man astride a scorching tractor seat when the thermometer is 120 each wears the invisible badge of courage.—*Palo Verde Valley Times*.

Howe Secretary of Highway Commission

John W. Howe has been named by Governor Rolph Secretary of the California Highway Commission, which position he assumed September 22d.

A Los Angeles newspaperman for sixteen years, during which time he occupied the positions of Assistant City Editor on the Los Angeles Examiner, Sunday Editor, Telegraph Editor, and recently Automobile Editor, Howe will become Editor of the CALIFORNIA HIGHWAYS AND PUBLIC WORKS BULLETIN starting with the next issue.

Prior to coming to California in 1915, Howe served on several New York newspapers, being eight years Day City Editor of the New York American.

Eric Cullenward who has been Secretary of the Commission for four months, recently was made Chief of the Bureau of Publications and Documents, a new bureau created by an act of the last Legislature to supervise and control publication of State documents other than those prepared by elected officers.

Husband—Good Heavens! Our daughter says in this telegram that she has eloped with a contortionist.
Wife—So that's what she meant when she said she was going to get something for the rumble seat.—*Motor Land*.

been outlined and supervised by A. D. Edmonston, Deputy State Engineer, and the investigation for the Sacramento River Basin has been executed under the immediate direction of T. B. Waddell, and salinity investigation of the Sacramento-San Joaquin Delta under the direction of Raymond Matthew.

Opening of Bartlett Springs Road Proves Signal for Community Dinner

WITH A LONG name and rejoicing over the opening of a long and whimsical road, the National Forest-Upper Lake-Bartlett Springs Highway Association members foregathered with invited guests at Bartlett Springs, Lake County, August 29th.

A safe road, a drivable highway, now threads the green draped mountains of Lake County between Upper Lake and the famous old resort. It is not a speedway, but it is

The officers of the association, J. A. Younggreen, President; and Roy Bucknell, Secretary, and Mrs. McMahon, were active hosts.

Present were; Congressman and Mrs. Lea of Santa Rosa; L. Brown, Highway Engineer, San Francisco; Chas. D. Hafferty, President Lake Co. Chamber of Commerce, Lakeport; Ben Bow, National Automobile Club; W. T. Smith, Supervisor, Lake County, Lakeport; J. A. McMinn, Redwood Empire



EVERYBODY HAPPY! They've just opened a new Lake County road and feel "mighty good."

Rear row (left to right): Al Banks, Frank Crayton, Don Younggreen, Lon Eichler, Roy Bucknell and H. H. Dunning. Front row: W. P. Mariner, W. T. Smith, Jack Frost, Mrs. Cal McMahon, James K. O'Brien and J. A. Younggreen.

no longer a trail; and it is such an improvement as to be a distinct achievement.

Thanks to the Federal Forest Aid Fund and the cooperation of the State Highway Division, the small sum of \$25,000 has been made to work wonders. It is a road of many, many curves, but it has a smooth and safe base and will improve under travel. Lake County folk and their neighbors feel "mighty good" over it. The work is practically finished.

COMMUNITY SPIRIT

The dinner at the springs brought together a representative company. Everybody was happy, and the addresses reflected a fine community spirit. Congressman Lea, a native of the section, made the principal address. State Senator Ingels spiced the program with some localized humor. Nearly every man present responded to the call of Chairman Younggreen.

Association, and Mrs. McMinn, Healdsburg; Victor Eichhoff, *The Press*, Lakeport; Mrs. Eichhoff, Yacht Club, Lakeport; Senator and Mrs. Ingels, Potter Valley; J. Frost, Manager of Bartlett; Arthur T. Poheim, Bartlett; Don Younggreen, Upper Lake; Lon Eichler, *Appeal-Democrat*, Marysville; Frank Crayton, President Colusa Chamber of Commerce, Colusa; W. P. Mariner, Supervisor, Lake County; Ed Enzenauer, Chairman Sonoma Board Supervisors, and Mrs. Enzenauer; H. H. Dunning, Marysville; Clyde Edmundson, General Manager Redwood Empire Association, and Mrs. Edmundson; Mrs. Cal. McMahon, Vice President Bartlett Springs Co.; Jas. K. O'Brien, President Tahoe-Ukiah Highway Association; A. L. Banks, Department of Public Works, Sacramento; Roy Bucknell, Postmaster Unupper Lake; J. A. Younggreen, Banker, Upper Lake.

Oil Spraying and Burning Clean Roadsides, Eliminate Fire Perils

DURING the past three years the Division of Highways Maintenance Department has made a systematic effort to conserve California's watershed, grazing and agricultural lands by the elimination of fire hazards adjacent to the roadways. The 1931 program, covering 1150 miles at a cost of \$80,000, extended into 46 counties of the State.

Prior to 1928 this work was on a somewhat limited scale and was mainly for the purpose of improving the appearance of the roadsides and only incidentally as a fire precaution. The serious fire losses of 1927 brought the matter forcibly to attention, and during the 1928 season the work was extended to include some major clearing of right of way as a fire precaution measure. The work that season covered 660 miles of roadsides.

MODE OF TREATMENT

The areas selected for treatment are generally opposite grain fields, pasture and heavy brush lands. The treatment is not applied through built up areas, orchard country or adjacent railroad rights of way which, in effect, constitute a natural firebreak.

The treatment consists of Diesel Oil of 27+ gravity applied to a nine-foot strip either side of the roadway at the rate of one-tenth to one-sixth gallon per square yard of surface treated. This is allowed to stand for a week after which the vegetation is fired. The application is made during the months of February and March while the vegetation is green so that when the treated area is burned fire will not spread to the adjacent fields.

EVERY PRECAUTION

The burning operations are conducted under very specific instructions and the crews so engaged are expected to use every precaution to protect traffic as well as trees, shrubs, fence posts and other inflammable property.

The development of proper equipment to spray considerable area at reasonable speed has required considerable experimenting. It was necessary that the spray be applied adjacent to the fence lines and that it be sufficiently flexible to use on cut and fill sections

of the foothill roads as well as the level-going valley turnpike sections.

The present outfit is a detachable trailer carrying pump and engine in addition to a turn-table and platform for the operator. The turn-table supports a telescopic outrigger arm which in turn carries a three-fourths-inch hose and spray bar consisting of a nine-foot section of three-fourths-inch steel tubing carrying eight orchard type spray jets. The outrigger may be extended or drawn in and may also be raised or rotated at the will of the operator. The spray bar also may be raised or lowered as desired.

13,000 GALLONS A DAY

The trailer and hose connections are so designed that transfer from an empty truck to a full one is only a matter of minutes. Outfits of this type are capable of spreading 13,000 gallons of distillate per eight-hour day.

The work of the Division of Highways in spraying and burning roadside vegetation to reduce fire hazards is supplemented by clearing in forest areas. Each fall and winter crews are engaged in cutting and burning slash and down timber within the State highway right of way. During the past winter a considerable sum was expended for this purpose out of the allotment made to relieve the unemployed, and it is expected to continue the work this winter with the relief forces which will be placed at work in October.

There are 7,947,000 miles of motor roads in the world.

Poor motorist—His life is full of unnecessary hardships. Just think, he has to wait until 1932 for a 1933 model car.

"What is a pedestrian?"
"It is a person with a wife, daughter, two sons, and a car."

An infernal machine is any kind of motor vehicle that ambles along the middle of the road at just about ten miles per hour.

Another reason why everybody wants a powerful car is to be able to get out of a parking place—by pushing half a dozen cars that have the brakes locked.
—*Motor Land*.

American products control approximately 90 per cent of the demand in Finland for automobile replacement parts, accessories and service appliances, according to Department of Commerce reports.

\$1,931,266 Income for Year in Shops

(Continued from page 6)

functions of the Equipment Department were the receiving and distribution of this second-hand equipment.

SELF-SUPPORTING

It is far different now. The responsibility has been gradually extended until at the present time the equipment service is a self-supporting subdivision of the Public Works Department.

The shop is not a factory. It maintains equipment, and it adapts it to special service. In building oilers, scrapers and fire trucks it has given evidence of ingenuity. It paints, repairs and services cars but it does not undertake body building or production in competition with specialized service. R. H. Stalnaker, the Equipment Engineer, who has developed the service, is not alone alert in delivering mechanical efficiency, but has a keen eye to the business angle. He is quoted as saying:

"The Equipment Department is self-supporting, subsisting solely upon the revenue it receives from the rental to other departments and divisions of its own possessions. The rentals collected cover an adequate depreciation reserve to retire all equipment at the end of its useful life, as well as to keep it in repair during the period of its use. These rentals are adjusted from time to time on the basis of experience.

YIELD SMALL SURPLUS

"During the past three fiscal years the rentals collected have yielded a small surplus over and above the expenses of the department and the depreciation reserve set aside. This surplus, after making a small deduction for contingencies, has been returned to the district responsible for its accumulation."

The average personnel of the department is about 350 men. There is a close system of inspection throughout, and the Accounting Department carries the cost and working history of every piece of equipment. Identified primarily with the Highway Division, the Headquarters Shop is, nevertheless, a State shop, serving every branch of the motorized service.

BUSINESS PROPOSITION

During the last fiscal year the Equipment Department collected in rentals for equip-

ment \$1,929,229. Miscellaneous revenue received amounted to \$2,037, bringing the total income of the department up to \$1,931,266. The operating expense of the department for the year was \$922,335. **There was set aside for depreciation and reserve \$892,178, and returned to the districts \$116,753.**

It is interesting to note that during the first 30 months of operation of the rental system and the control of equipment by a central headquarters 56.2 per cent of the rental received was expended for repairs to equipment and 13.2 per cent for administration and miscellaneous expenses, leaving 30.6 per cent available for depreciation reserve, while in a recent annual report there was shown to have been expended for repairs only 37.5 per cent and for administration and miscellaneous expenses 10.3 per cent, while the portion available for depreciation reserve had increased to 52.2 per cent.

HIGHLY ORGANIZED

The inventory value of the rental equipment in the hands of the Equipment Department at the end of the fiscal year amounted to approximately \$3,500,000. The replacement value of this equipment would be considerably higher as the appraised values are in all cases considerably below not only the original cost, but the replacement cost at this time, to the State.

F. E. Burnside, Shop Superintendent, has his men under close supervision, there being a foreman to the average group of twenty. He insists on study and improvement, and the smoothness with which work proceeds quickly attracts notice. He says, "Our work ranges from small instruments to gas shovels and fire trucks. It is up to us to adjust and adapt machinery to the Division's peculiar and varied needs, and to maintain it up to the most efficient point possible."

So immersed are men like Stalnaker and Burnside in their work that they have absorbed its many angles; and they are often called on to produce technical papers before societies interested in the vital phase they represent in Maintenance Service.

It must have been something of a blow to the father of six lovely daughters who, while reading a telegram from home announcing the birth of a seventh lovely daughter, looked up and saw the sign: "If you want a boy, call Western Union."—*Exchange*.

Build Roads NOW While Cost is Low And Men Need Work

EXPENDITURES on highways are profitable now because of the needs of the unemployed and the low cost of accomplishing needed road and street improvements, according to W. R. Smith, president of the American Road Builders' Association.

"Road building readily absorbs men engaged in all industries that are temporarily inactive. No special training is required for common labor on the roads and streets and, therefore, highway building is an ideal public work for the relief of unemployment. A man who is given a job does not lose his self-respect like one who is forced to accept charity.

"The recent statement of a representative of the American Society of Automotive Engineers that within a decade road speeds of 100 miles an hour are to be expected gives an idea of the additional burdens that are continually being placed on the highways. We may expect under such speed conditions express highways with marginal roads for slow traffic, much elimination of both highway and railroad grade crossings, and the relocation and widening of many highways to fit them to handle high speed traffic. The formula for highways, safe drivers plus safe vehicles plus safe roads equals safety, states the three elements that must be considered.

"Roads for the public can be built now at a much lower cost than in past years and it is highly improbable that the present conditions of depressed prices will continue indefinitely. The public can buy roads and streets now to advantage.

The expansion of the highway program needed to bring roads and street facilities up to the standard of motor vehicle improvement will do much to stimulate business."

BRIEF AND TO THE POINT

If people would whistle more and whine less; work more and worry less; boost more and beef less; give more and grab less; business would be better darn fast. (Signed) *Galen Starr Rose.*

A man who had been waiting patiently in the post office could not attract the attention of either of the girls behind the counter.

"The evening cloak," explained one of the girls to her companions, "was a redingote designed in gorgeous brocade, with fox fur and wide pagoda sleeves." At this point the long-suffering customer broke in with "I wonder if you could provide me with a neat red stamp with a dinkie perforated hem, the tout ensemble treated on the reverse side with gum arabic? Something about two cents."—*Wall Street Journal.*

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
ERIC CULLENWARD.....Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 9 SEPTEMBER, 1931 No. 9

THE ROAD PROGRAM

Programs of Federal, State and county governments for 1931 road construction call for a total expenditure of \$1,616,000,000, which is an increase of \$15,000,000 over the 1930 appropriations. The Federal contribution of \$249,897,000 is \$150,000,000 over 1930.

The problem of unemployment has been the most important factor in California for the increase in road budgets, and the farm-to-market movement has been another important issue for the State road program.

From the tourist standpoint Modocers travel the Alturas-Redding lateral can readily see how a part of the 1931 State appropriation is being spent.

Those who have lived here for the past five years have seen the road evolve from a wagon trail to a smooth and safe highway.

It might be said that the money we spend for roads gives us a better return than almost any other form of government tax expenditures. Quick and economical transportation of goods and persons is vital to social and economic progress. Particularly is this true of the rural areas where roads have been in essentially the same state of unimprovement since the horse and wagon days. Only by building inexpensive, but good roads, can farming sections be given a place in the march forward.—*Alturas Times.*

"Really, I can't play golf," the sweet young thing said. "I don't even know how to hold the caddy."

"Where's the car, Dad?" asked the son of an absent-minded professor.

"Why, dear me, I really don't know," he said, scratching his head in an effort to recall the past. "Did I take it out?"

"You certainly did. You drove it downtown this morning."

"Well, now, that is quite remarkable," said the professor. "I remember now that after I got out I turned round to thank the gentleman who had given me the lift and wondered where he had gone!"

—*Motor Land.*

State Prepared for Olympiad Traffic

(Continued from page 17)

Within California this route passes through an interesting volcanic country, replete with memories of the famous Modoc Indian War, to the head of the Sacramento Valley at Redding. The Redding-Alturas lateral is an improved oiled road well maintained and its scenic beauty well repays for its lack of pavement and high speed qualities.

From America's great northwest of Washington and Oregon connections are made with two main arteries of California's State highway system.

SCENIC ENTRANCE

The one enters California in the Siskiyou Mountains between Ashland, Oregon, and Yreka. This highway is of highest standards and, with the new construction just being completed along the rim of Shasta Canyon, presents a scenic entrance into the State. From Redding south the central artery of the State road system traverses the broad Sacramento Valley, with a choice of routes, equally well paved, on either side of the river, to the capital city.

From Sacramento the motorist may travel to Los Angeles by way of San Francisco and the Coast Route or he may take the shorter Valley Route known as the Golden State Highway. This section of the central stem of the highway network is a modern intercity boulevard of the highest type. Its reconstruction, throughout the fertile San Joaquin Valley with its thousands of acres of fruit, grain and vineyards, has been steadily pushed ahead.

FINE WIDE PAVEMENT

There are few stretches where the pavement is less than 20 feet wide or the roadbed less than 26 feet. The road is straight and smooth through the valley and crosses the Tehachapi Range by the famous Ridge Route which, in its present condition, presents wide pavements and broad curves and is all that could be desired of a mountain highway.

From the base of the mountains into Los Angeles this artery is, for the most part, a wide, three-lane pavement of Portland cement concrete.

The other route from Washington and Oregon enters California either by way of Marshfield on the coast, or by Grants Pass in

the mountains, to Crescent City, California's most northerly seaport.

"MOST" BEAUTIFUL

There is probably no more beautiful trip in California than this drive along the high bluffs overlooking the Pacific and through the famed redwood groves of Del Norte and Humboldt counties. This scenic highway extending along the 400 miles of coast from the Oregon line to San Francisco Bay has been graded, surfaced and paved so that it may be safely traversed by the most cautious of drivers. The past two years have seen a vast amount of construction over its entire length, both north and south of Eureka and throughout Marin County. It is not often that a highway of this high type can be found along a mountainous coast which offers the outlooks and vistas of beauty as found along California's Redwood Highway.

From cosmopolitan and enchanting San Francisco, the most obvious route to the southern metropolis of the State is the beautiful Coast Route.

ALONG SEASHORE

This intercity highway follows the San Francisco Peninsula to San Jose; thence through the peaceful Santa Clara and broad Salinas valleys, over the Coast Range and down to the broad shores of the Pacific at San Luis Obispo. From here the road skirts the ocean and passes through charming Santa Barbara and into Los Angeles, either by turning inland south of Ventura and entering the southern city through Hollywood, or by following the rugged shore line between Oxnard and Santa Monica.

Throughout its length this highway is a high-speed arterial.

The web of California's traffic lanes into the West's largest metropolis is of the highest type of modern construction, and the Administration and entire State point with pride to the forty-five hundred miles of paved and surfaced State highways which bind California into a unit. The visitor to the Olympic Games in southern California will enthusiastically verify our premise: "All roads lead to Los Angeles and the Tenth Olympiad."

Clever, Curious These Ants, and Deadly Workers

(Continued from page 5)

ably be found to be termites, and, if so, precautions should at once be taken to keep them away from frame structures, or, if they are already present, to get them out and keep them out. Numerous State buildings have already become badly infested to such an extent that, for one building located in the southern part of the State, the structural timbers were reduced to a mere shell and the building had to be condemned.

In this incidence, it was the "Kaloterms" or Dry Wood Type that was responsible.

Our principal problem, however, is one of prevention. Accordingly, certain requirements are being laid down in our specifications which will, we think, reduce the possibility of infestation to a minimum.

HARD TO CHECK

The writer has, for a number of years, been keenly interested in a study of the habits of the various species, common to the Pacific Coast, as it is only through such a knowledge that the type can be distinguished and the proper methods of control be used. Control is about all that can be hoped to be accomplished, and, even then, it is very doubtful whether certain types, such as the dry wood species, can be effectively checked.

We are informed by entomologists that the termite has existed for many millions of years, coming up through the different geological ages, and that they have probably existed ever since there has been any kind of carbonaceous growth in the world. Geologists as well as entomologists have identified them embedded in fossil amber. Traces of them have been found in the secondary as well as the tertiary geological periods. They are the most ancient of all existing life. Their civilization is not only the oldest, but the most curious, complex and intelligent that has ever appeared on this earth with the possible exception of man. It has certainly shown itself to be the best fitted to adapt itself to the difficulties of existence.

MANY KNOWN SPECIES

In spite of its misnomer, the White Ant, the termite, except for the reproducer which are black, approximate the color of the earth that it lives in, varying in size from 3 to 12 millimeters, according to the species. Entomologists state that there are 1200 to 1500 known species, of which forty-two have been found in the United States.

Thirteen species divided into four general classifications are common to the Pacific Coast. They have been exceedingly destructive in the tropical and sub-tropical countries for many years but it is only during the past decade that they have been cause for any concern in this country. This is due, primarily, to the destruction of our forests and the great increase of dead wood so that, conditions becoming more favorable to their growth, they have now reached the



LEUCOTERMES FLAVIPES—That's what they are. They've come up through the cracks between boards of infested floor and made crater-like openings. They're bad, real bad, these termites.

point where the damage to pole lines alone has run into hundreds of thousands of dollars.

The termites have been especially active in Pasadena, Pomona and other southern California cities. From southern California they have spread to Arizona and Texas. The pole line has probably been the infection center from which they are spreading to the buildings. They are also rapidly spreading northward.

HAS PECULIARITIES

Sacramento is becoming quite badly infected with the subterranean type and the writer has found one dwelling here which had been attacked by the dry wood type. He has found rotted wood termites as far north as Plumas County. The termites thus far found on the Pacific Coast are divided into the following general classifications, each class having its own peculiarities which must be considered in any measures taken to eradicate them. These classes are as follows:

1. Rotted Wood Termites "Genus Termopsis" which attack decayed or rotted wood. The termites of this class are the largest species in size.
2. Sound Wood or Dry Wood Termites "Kaloterms" which are divided into three varieties. They live in sound, dry wood and need no ground connections or moisture.
3. The Subterranean Termites "Reticulitermes" which live in the earth from which they come to attack timber, returning to their termitaries in the earth through tubes which they build from the ground to the point of attack. This type is the one that constitutes our greatest problem in the North.
4. The Desert Type "Leucotermes" which occur in the southern part of the State. They build tubes similar in character to those constructed by the Subterranean type.

There are many varieties in these types, as well

Dead and Rotted Wood Termites' Food

(Continued from preceding page)

as in the other types not found on the Coast. Cellulose or woody material constitute their sole food supply. They also use this material to line the walls of their tunnels and construct their termitaries, adding sand and other material strongly cemented together. In the Orient these structures cover as much as an acre of ground and are often 16' or more in height.

While the smaller varieties of termites are about the size of an ant, they are distinctively different in shape, entirely lacking the wasp-shaped body of the ant. They are soft-bodied, consisting of head, thorax and abdomen. Common with other insects they have six legs. They keep entirely out of the light, except during colonizing periods, always remaining concealed within the wood, their termitaries, or their shelter tubes.

EXTREMELY DESTRUCTIVE

The wood is frequently honeycombed, nothing being left but a shell of tissue paper thickness.

As far as is known, termites do not attack living timber but confine themselves to dead wood, rotted wood lying on the ground, or wood that has been cut preparatory to use, or that is being used by man. Having once gained access to a wooden structure, they continue to feed on the wood until it is a mere shell and collapses. It is said that they have completely destroyed wooden buildings in the Orient within two or three years.

It is the ant who is their greatest enemy, and at the same time, is responsible for their greatest development. There is a strong resemblance to the ant in the organization of their colonies and in their highly developed social instincts, with cast divisions of Queen, King, Alates, Soldiers and Workers. Their evolution from the lower to the higher forms can be very readily traced in the existing species.

KING AND QUEEN RULE

It has been observed that there are certain favorable locations that become infection centers for the termites and that at regular periods the reproductive castes swarm, growing wings and flying in large numbers from the colonies. New colonies are established by each pair, King and Queen, where conditions are favorable to their growth. After getting the initial start, they increase very rapidly. It has been estimated that a Queen Termite lays over a million eggs in one year, continuing at this rate for about three years when a new Queen takes her place. We are informed that in the absence of a reproductive, a new Queen can be created from one of the sterile castes.

The Subterranean Termites live almost entirely in the ground with which they maintain a connection while attacking timber. They usually first attack sound or decaying timber left on the ground as carpenters' refuse or as forms for basement walls and foundations. Either through form lumber or by means of earthenlike tubes, very easily distinguished by one familiar with them, they crawl up and infest the main portion of the building. Of course, if the main structure is built very close to the ground, their entry to the timber is that much easier. They also penetrate masonry walls where a poor grade of mortar has been used and then work up through interior of the walls.

POISON IS USED

The Division of Architecture requires, for new con-

struction, that all form lumber and carpenters' refuse shall be entirely removed from the basement area, that frame construction in the basement area shall be treated by combined wood preservative and termite poison, and that, in addition, the ground area under the building shall be treated so as to provide a poison zone through which the termites would have to pass either to reach the wood above or to return to the ground from the structure above. Where old structures are found to have been attacked, infected wood is removed and burned and the ground surface, both inside and immediately adjacent, is thoroughly impregnated with sodium arsenite, borax or other termite repellants.

The Subterranean Type can be positively controlled by eliminating moisture or dampness. Therefore, if their tubes are broken so that they are cut off from the ground, those present in the structure will die since they can not get back to the earth to obtain moisture. Of course, if there is leaky plumbing in the building, the termites can continue to live and multiply as long as the condition exists.

DON'T LIKE GASOLINE

When in doubt as to whether there are Subterranean Termites present in the locality in question, wood stakes can be driven into the ground to a depth of about 6 inches. Inspection of these stakes in about five or six weeks will tell if they are present.

It is known that termites have an aversion to gasoline and asphalt products. Certain poisons will destroy them and, as some varieties consume their dead, the effect of poison is far reaching. For this reason any poison used in combatting them should be in a somewhat dilute form so that they will live long enough after coming in contact with it to return to their termitaries and thereby reach the reproductive center.

The Dry Wood Termites are the most difficult of the types common to California to combat successfully due to their nondependence on a moisture supply. They have no ground contacts. They enter a structure in the upper portion through cracks, nail holes, etc., and immediately penetrate the wood.

OCCUPY LARGE AREAS

While they prefer sapwood, they also work to a certain extent in the heartwood of the timber. Consequently, their presence is not discovered until after the colony or colonies have spread over large areas and very material damage has been done.

In order to control them, all infected wood should be removed and burned and, where this is impossible, Orthodichlorobenzene should be forced into the workings, or Paris Green introduced by bellows. This last method is quite effective due to the habit of the termites of grooming one another. The Los Angeles Building Department recommends treating the wood with creosote or with a 25 per cent solution of sodium arsenite. Wood so treated should, however, be painted after the poison is applied if one is to be sure that the treatment will be permanently effective.

The highest airplane landing field in the United States has just been opened at an elevation of 9000 feet on South Fork Meadows in Inyo National Forest, states a forest service report.

They Eat Fire, These "Highwaymen"

Mr. S. V. Cortelyou,
Division Engineer,
Los Angeles, California.

Dear Sir:

I wish to call attention to the good work of your foreman, Mr. James A. Stauff, at a recent fire we had on the Roosevelt Highway near Las Flores Canyon. Two beach cabins were on fire which threatened to spread to other cabins in the vicinity, and although this was after hours, the fire occurring at about 5:30 p.m., Mr. Stauff very kindly offered his services and did some very excellent work in helping us put out the fire.

I wish to take this opportunity in saying that Mr. Stauff has always cooperated with our department in every way, and wish to thank him and your organization for the hearty cooperation shown us.

Very truly yours,

SPENCE D. TURNER,
County Forester and Fire Warden,
Los Angeles.

Mr. Frank Burnside,
Division of Highways,
Sacramento, California.

Dear Mr. Burnside:

I wish to take this opportunity to express to you my appreciation of the excellent work done on the Rubicon fire on the El Dorado Forest by the following men who were sent out from your shops:

Ed. Shick, Fred H. Dodson, Paul Fenwick, R. G. Russel, Tom Ceccattini, Jack Rowe, Graham Rider.

Ranger Morris reports that the above men rendered most excellent service and it was through their energy and enthusiasm that this fire was checked in the small acreage that it was. I might add that the mere fact of man power in a country like Rubicon Canyon is not an indicator of how soon a fire will be checked, but the push and snap and determination of the man power is the factor that counts, and these men showed all of these.

Very sincerely yours,

EDWIN F. SMITH,
Forest Supervisor, Placerville.

State Irrigation Districts get O.K.

California irrigation districts are in comparatively healthy shape and far from general collapse.

That is the statement of State Engineer Edward Hyatt contained in a bulletin, No. 21-B, dealing with irrigation problems throughout the State.

Ninety-three per cent of 1930 bond payments due were paid, says the bulletin, despite the fact that, in general, the returns from the land did not exceed 75 per cent of those of 1929.

The report says that certain districts, intrinsically solvent, should have an extension of credit or a reduction in interest rates or both, and that districts in bad financial condition will require adjustment of debts in comparison with the ability of the land to pay.

Falling off of returns from farm operations during 1930 are blamed by the Division of Water Resources for the poor financial condition of a few of the irrigation districts.

Watch Auto Lights! Here's Law Digest

Do the lights on your car comply with the law?

All vehicles must carry lights from one-half hour after sunset to one-half hour before sunrise. Two headlights are required in front and one red light in the rear. Red tail lights are also required on trailers. Red lights which are visible from the front are prohibited on private automobiles. A red tail light is always required on the rear of vehicles which are stopped on the open road in the nighttime, and also in a city, unless there is sufficient light to reveal substantial objects for two hundred feet.

Glaring headlights are prohibited. Headlights are deemed to be glaring or dazzling when any part of the main bright portion of the beam strikes an object higher than the lamp center twenty-five feet or more ahead of the vehicle.

Americans are forgetting how to walk. But those who still can walk are learning to jump, and that helps some.

Gunston: "How do you spend your income?"

Durkee: "About 30 per cent for shelter, 30 per cent for clothing, 40 per cent for food and 20 per cent for amusement."

Gunston: "But that adds up to 120 per cent."

Durkee: "That's right."

Mrs. Bleep—Are you a back-seat driver?
Mrs. Bleep—Indeed I'm not! I sit right where I can grab the wheel if he doesn't do what I tell him!

—Motor Land.

ARCHITECTURAL AWARDS For Month of August

List of projects handled by the Division of Architecture for which contracts were awarded by Colonel Walter E. Garrison, Director of Public Works, during the month of August, 1931.

August 4, 1931—H. E. Pynn—Cottage for caretaker, Mount Diablo State Park.....	\$3,167 00
August 6, 1931—Raymond Concrete Pile Co.—Pile foundation work, water tower at Farm, Agnews State Hospital....	3,885 00
August 6, 1931—Otis Elevator Co.—Plunger electric sidewalk elevator, new dining room, San Quentin State Prison.....	947 00
August 6, 1931—Pacific Elevator and Equipment Co.—Alterations to passenger elevator, State Capitol.....	2,750 00
August 6, 1931—Anton Johnson—General work, Detention Building, California Institution for Women.....	72,490 00
August 6, 1931—Hickman Bros.—Plumbing work, Detention Building, California Institution for Women.....	11,990 00
August 6, 1931—George L. Patterson—Electrical Work, Detention Building, California Institution for Women....	2,355 00
August 6, 1931—E. J. Mattocks—Drilling and testing water well, Agnews State Hospital.....	6,285 00
August 7, 1931—J. E. Welsh—Heating Work, Detention Building, California Institution for Women.....	10,964 00
August 7, 1931—Oliver S. Almie—Border Inspection Station, Department of Agriculture, Crescent City.....	8,738 00
Total.....	\$123,571 00

No advertisements for bids have been issued since July 17, 1931, pending the wage scale act becoming effective and establishing a prevailing wage scale.

TO BUILD IS TO PROSPER

Idle money will remain as long as men are kept idle, and a state, county or city without good roads is behind the times, said A. P. Greensfelder in an address before the annual convention of the American Road Builders' Association at Washington.

"Are we going to stand still or help our communities to climb out of the depression?" he asked. "Construction is the balance wheel of American industry and follows closely the trend of industrial conditions. The laborer in building highways demands gloves, shirts, shoes, bacon, bread and other necessities."

Grocer: You want a pound of ochre? Is it red ochre for painting bricks?

Small boy: No, it's tappy ochre wot Maw makes puddin' with.—*Exchange*.

A small crowd of taxpayers of perhaps 100, more or less, had called upon the county board to protest the condition of a certain road. After all had been heard, the chairman of the board in a polite manner said: "From all reports, I'd say the road was fairly good, taken as a whole."

"True," said the spokesman for the complainants, "but we want to use it as a road, not as a hole."

Long, Bitter Battle For Colorado Water Brought to an End

VICTORY for the Department of Public Works in settling the long battle over allocation of the waters of the Colorado River, was announced at the last meeting of the Governor's Council by Colonel Walter E. Garrison. His report which tells the story, follows:

It is with keen satisfaction that I am able to report settlement of the long fight over allocation of the waters of the Colorado River.

The agreement ends an extended and bitter battle between agricultural interests and big cities of southern California.

RECORD BREAKER

The accord reached might be called the most important settlement of a water controversy since the Colorado River Compact was signed in 1922.

In the amount of water involved, it far transcends anything which has hitherto ever been done in the history of this or any other state of this country.

The agreement affects the so-called agricultural group, comprising Chuckawalla, Palo Verde, Imperial and Coachella irrigation and water districts on the one side and the metropolitan group composed of the city of Los Angeles, the Metropolitan Water District of southern California, the city of San Diego and the county of San Diego on the other.

WASHINGTON'S REQUEST

This accord was worked out by the Department of Public Works at the request of the Secretary of the Interior. It had been impossible, apparently, for the interested parties to come to any understanding on division of the Colorado waters.

In November, 1930, we received a request from Washington, that the Department of Public Works adjudicate the matter and try to reconcile the views of those interests desiring to use the water.

As a consequence a series of conferences were held between the groups named above, Northcutt Ely, Executive Assistant of the Secretary of the Interior, legal and engineering representatives of the United States Bureau of Reclamation, and our department.

A complete set of priorities and amounts of water to be used by each of the interests whose plans are definite enough to be considered at this time was established.

The agreement does not allocate specifically all the water which California may expect under the Boulder Dam Act and the Colorado River Compact. But it does state that all the water not allocated by the agreement, shall be used for agricultural interests east of the Coast Range and therefore, leaves some water for possible future developments.

A magnetic road sweeper or nail picker operating over 1200 miles of state highways in North Dakota during a period of 60 days, collected almost 7 tons of metal. This is an average of about 12 pounds per mile of road.

The curfew tolls the knell of parting day,
A line of cars winds slowly o'er the lea;

A pedestrian plods his absent-minded way
And leaves the world quite unexpectedly.

—*Exchange*.

WATER RESOURCES

*Official Report
As Of
September 1, 1931*

That the immediate crisis in water shortage in the Sacramento-San Joaquin territory is over, is indicated in the regular monthly official report of the Division of Water Resources under Edward Hyatt. Many new low records were established during August, particulars concerning which are included in the report. Details of flood control and reclamation activities, tabulation of dam applications and news of the irrigation districts also are included:

During the past month the regular field work has continued in the Sacramento-San Joaquin district, comprising measurements of all diversions, stream flow, and return water throughout the territory.

The draft on the Sacramento River due to irrigation diversions reached its peak during the past month, averaging approximately 4000 sec. ft. from Red Bluff to Sacramento. With the reduced inflow at Red Bluff this draft took not only the inflow but practically all of the return flow in the lower stretches as well. Within the past few days there has been some reduction in the draft and it is thought that the crisis in water shortage has passed. Some of the rice fields have reached maturity and have already started to drain off the water.

The past month has witnessed the establishment of many new low stream flow records. The low flow at Verona, 20 miles above Sacramento, apparently was reached on July 23 and 24 when the flow was only 260 sec. ft. At this time the irrigation draft between Verona and Sacramento considerably exceeded the Verona plus the small American River inflow so that there was no flow in the river at Sacramento. Tidal cycle measurements of flow at Sacramento were made July 9-12, 15-16, 20-23. During the measurement July 9-12, a maximum upstream discharge at high tide of 3850 sec. ft. was measured. In this cycle of measurements also it was found that there was an upstream flow for a total of practically 12 hours. A float placed in the stream showed a total upstream movement of 6 miles.

GRADUAL DECREASE

Due to the recent reduction in draft, flow at Verona has now come up to about 600 sec. ft. At Red Bluff there has been a very gradual decrease with a new record low of 2600 sec. ft. on August 10, and no indication of a rise. The minimum flow of the San Joaquin River near Vernalis apparently appeared on July 28, with 200 sec. ft. flow. There has been a slight increase since that date. At the end of July, therefore, there was a flow to the delta of not more than 200 sec. ft. from the Sacramento and San Joaquin rivers. When it is considered that 3300 sec. ft. is needed at the lower end of Sherman Island to control salinity in the delta, and 3700 sec. ft. is

needed to supply the consumptive use in the delta at the peak of summer, making a total of 7000 sec. ft. needed to prevent salinity encroachment and supply delta consumptive use, the extent and rapidity of this season's salinity encroachment will be more readily understood.

USERS ANXIOUS

The salinity sampling in the delta has continued as in the past month, and has been extended where necessary to completely record the encroachment. The delta water users have been greatly concerned as to the results of the salinity tests and bulletins giving the results have therefore been sent to a mailing list of over 200 water users at approximately four-day intervals.

Many special samples have also been reported. Special salinity sampling traverses have been made from Paintersville Bridge to Sacramento at regular intervals to establish clearly the rate of encroachment. The traverse of August 10 showed that the point reached by salinity of 100 parts of chlorine per 100,000 was one-half mile above Courtland, and that the point where it was just beginning to show was two miles above Hood Ferry. Probably two-thirds of the delta area now lies below the line of 100 parts of chlorine per 100,000 used as the rough figure for the danger line in irrigation. Where the high salinity exists, practically all the irrigation has stopped except that for celery. Two special investigators have been placed in the field to determine, one in the delta and the other in the up-river territory, all facts which will furnish a definite report for the present season on the actual damage which may have been or will result from the water shortage.

The water conservation campaign along the river above Sacramento has continued and has been successful in keeping waste to practically nothing. The accompanying table shows the comparison between the 1931 and 1924 stream flow and salinity data.

Station	Discharge in sec. ft.			
	1931		1924	
Sacramento River at Red Bluff-----	8/10	2600	8/10	2900
Sacramento River at Butte City-----	8/11	1130	8/11	1680
Sacramento River at Colusa-----	8/11	992	8/11	1650
Sacramento River at Knights Landing--	8/10	597	8/10	1150
Sacramento River at Verona-----	8/12	798		
Sacramento River at Sacramento-----	8/12	550		
Feather River at Nicolaus-----	8/12	46	8/12	0
American River at H. St. Bridge-----	8/13	38	8/13	9
San Joaquin River near Vernalis-----	8/10	260	8/10	422
Combined flow of Sacramento River at Sacramento and San Joaquin River near Vernalis-----	8/12	810	8/12	1432

Salinity Tests Sacramento-San Joaquin Delta

Station	Salinity in parts of chlorine per 100,000	
	8/10/31	8/10/24
O. and A. Ferry-----	1320	1290
Collinsville-----	1190	985
Emmattson-----	900	636

(Continued on page 36)

The California Highway Dollar

WHERE IT COMES FROM

	Amount, cents
Motor Vehicle Fees.....	12.27
Gasoline Tax.....	75.00
Transportation Companies Franchise Tax.....	1.61
Federal Aid.....	11.12
Total	100.00

WHERE IT GOES

	Amount, cents
New Construction.....	41.55
Reconstruction	23.39
General Maintenance.....	11.62
Special Maintenance.....	7.54
Administration	3.55
Surveys and Plans.....	3.83
Right of Way.....	6.51
Buildings, Plants and Equipment.....	1.12
Joint Highway Districts.....	0.89
Total	100.00

Car's Serial Number Needed for License

The serial number of the car and number of cylinders will hereafter be required on all applications for auto license renewal and transfers of second-hand cars or registration of new cars.

This information will be required says Russell Bevans, Acting Registrar of Motor Vehicles, in order to comply with the new provisions of sections 37 and 41 of the Motor Vehicle Act effective August 14th.

New certificate forms for 1932 will have spaces in which this information will be inserted.

As licenses are renewed and transfers made on the old certificates which do not have these spaces it will be necessary for the motorist to write in the information on the face of the old certificate of registration.

Captain Elmer Little: "Did you get that fellow's number?"

Unnamed Patrolman: "Naw, he was too fast for me."

Captain: "But, gee, that was a pretty brown-eyed gal he had with him sitting in the rumble seat."

Nameless One: "She sure was."—*Earth Mover*.

Not One Complaint Received on Oiling

A little praise now and then is relished by the best of men.

The Department of Public Works was very pleased with the reaction of press and public to Governor Rolph's executive order halting oiling operations on all State highways during the Independence Day holiday period.

Now comes C. C. Cottrell, manager of the Highways Bureau of the California State Automobile Association, who, in a letter to C. H. Purcell, State Highway Engineer, has this to say:

Dear Mr. Purcell:

I am very happy to advise you that so far this year we have not received a single complaint of your oiling operations.

In view of the nature of the work and oftentimes an impatient motoring public, we think this is an excellent record and therefore wish to compliment the men in your department having charge of this work.

Laws of practically all states prohibit traveling down grade with gears in neutral.

Dollar for Dollar Return Assured in Winter Relief Plan

(Continued from page 1)

during the months when labor will be under its greatest stress.

Statistical data compiled under the direction of C. H. Purcell, Chief of the Division of Highways, reveals that during the year 1931 State highway construction in California will amount to \$37,200,000.

During the first seven months of the year, January 1st to July 31st, contracts were awarded for road construction amounting to \$14,400,000. Contracts awarded the first seven months of 1930 amounted to \$11,000,000.

By December 31st additional contracts will be awarded and projects advertised for bids amounting to \$15,350,000. In addition to work let by contract, the State will spend \$7,450,000 for maintenance and minor improvements.

The following tabulations, arranged according to the classifications of the American Association of State Highway Officials, show the progress of the State's highway program for the year:

MILEAGE OF HIGHWAYS COMPLETED AND LET TO CONTRACT

January 1, 1931, to July 31, 1931

	Miles com- pleted	Miles con- tracted
High Type (Pavement)-----	91	144
Low Type (Bituminous Treated and Untreated Rock Surface)	116	348
Graded-----	45	56
Total-----	252	548

Oiled to Lay Dust----- 1,685

PROGRAM OF HIGHWAY CONSTRUCTION

August 1, 1931, to December 31, 1931

	Miles to be contracted
High Type-----	158
Low Type-----	156
Graded-----	53
Total-----	367

Total to be contracted for in 1931----- 915

To accomplish this task of highway construction an average of 8000 men are continuously employed by the State and con-



Col. Walter E. Garrison

tractors. The maximum number employed at one time during the first seven months of the year was 8550.

"Children should be seen and not heard," grandpa warned little Willie.

"You let that child say anything he wants to," bristled his mother. "I sold three of his bright sayings last month."—*Forbes*.

Deacon Callahan took his wife to the races. Just as the horses were lining up at the barrier Mrs. Callahan grasped the deacon nervously by the arm, and in a voice which was filled with emotion asked him for a safety pin, meanwhile grabbing frantically after something that seemed to be slipping around the knees. Just then some one near by shouted: "They're off!" And Mrs. Callahan fainted.—*Labor*.

During the day Mrs. Brown discharged her old maid and hired a new one, who answered the door bell when Mr. Brown arrived home in the evening. He carried a bunch of roses which he handed to the maid, saying:

"Present these to Mrs. Brown, telling her I want to see her at once."

"All right," said the maid, "but you better make it snappy, because she expects the old man any minute now."

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of August, 1931.

NEVADA COUNTY—Donner Lake Dam No. 301. Donner Lake Company, San Francisco, owner; buttress dam, 13 feet above streambed with a storage capacity of 11,000 acre-feet, situated on Donner Creek tributary to Truckee River in Sec. 18, T. 17 N., R. 16 E., M. D. B. and M., for storage purposes, for recreation use.

LASSEN COUNTY—Jessen Dam No. 252. Mrs. M. L. Cone, Red Bluff, California, owner; earth dam, 43 feet above streambed with a storage capacity of 1600 acre-feet, located in Sec. 17, T. 34 N., R. 9 E., M. D. B. and M., for storage purposes, for stock use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources, during the month of August, 1931.

SANTA BARBARA COUNTY—La Patera Dam No. 751. Sherman P. Stow Co., Santa Barbara, California, owner; earth, 14.7 feet above streambed with a storage capacity of 162 acre-feet, situated on La Patera Depression in Sec. 7, T. 4 N., R. 28 W., S. B. E. and M., for storage purposes, for irrigation use. Estimated cost \$11,000, fees paid \$110.00.

SAN MATEO COUNTY—Cascade Creek Dam No. 607-2. Humphrey Estate, Inc., Pescadero, owner; hydraulic fill, 523 feet above streambed with a storage capacity of 52 acre-feet, situated on Cascade Creek tributary to Pacific Ocean in Sec. 21, T. 9 N., R. 4 W., M. D. B. and M., for storage purposes, for domestic and irrigation use. Estimated cost \$5,750, fees paid \$57.50.

TUOLUMNE COUNTY—Bigelow Lake Dam No. 550. Tuolumne County, Sonora, owner; gravity dam, 8 feet above streambed with a storage capacity of 460 acre-feet, situated on East Fork of Cherry River tributary to Tuolumne, located in Sec. 35, T. 4 N., R. 21 E., M. D. B. and M., for storage purposes, for fish conservation use. Estimated cost \$650, fees paid \$20.

TUOLUMNE COUNTY—Buck Lake Dam No. 550-2. Tuolumne County, Sonora, owner; gravity dam, 8 feet above streambed with a storage capacity of 360 acre-feet, situated on Buck Meadows Creek tributary to West Fork Cherry Creek in Sec. 24, T. 4 N., R. 20 E., M. D. B. and M., for storage purposes, for fish conservation use. Estimated cost \$700, fees paid \$20.

PLACER COUNTY—Pulp Mill Diversion Dam No. 97-106. Pacific Gas and Electric Company, San Francisco, owner; arch, 25 feet above streambed with a storage capacity of 3 acre-feet, situated on Canyon Creek tributary to North Fork American River. For diversion purposes, for power use. Estimated cost \$2,500, fees paid \$25.

SISKIYOU COUNTY—Iron Gate Dam No. 91-3. California-Oregon Power Company, San Francisco, owner; arch, 165 feet above streambed with a storage capacity of 59,000 acre-feet, situated on Klamath River tributary to Pacific Ocean in Sec. 9, T. 47 N., R. 5 W., M. D. B. and M., for diversion and storage purposes, for power use. Estimated cost \$1,500,000, fees paid \$6,000.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of August, 1931.

TUOLUMNE COUNTY—Kincaid Dam No. 97-72. Pacific Gas and Electric Company, San Francisco, owner; earth dam, situated on small creek tributary to Curtis Creek in Sec. 9, T. 1 N., R. 15 E., M. D. B. and M.

SHASTA COUNTY—Baldwin Dam No. 97-85. Pacific Gas and Electric Company, San Francisco, owner;

earth dam, located in Sec. 23, T. 31 N., R. 1 E., M. D. B. and M.

FRESNO COUNTY—Florence Lake Dam No. 104-9. Southern California Edison Company, Los Angeles, owner; multiple arch dam, situated on South Fork San Joaquin River tributary to San Joaquin River in Sec. 1, T. 8 S., R. 27 E., M. D. B. and M.

PLACER AND SACRAMENTO COUNTIES—Diversion Dam No. 324. North Fork Ditch Company, Sacramento, owner; gravity dam, situated on North Fork American River tributary to American River, located in Sec. 23, T. 12 N., R. 8 E., M. D. B. and M.

RIVERSIDE COUNTY—Mockingbird Dam No. 814. Gage Canal Company, Riverside, owner; earth, situated on Mockingbird Canyon in Sec. 20, T. 3 S., R. 5 W., S. B. E. and M.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on North Canyon Creek tributary to Sacramento River in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M.

SOLANO COUNTY—Lake Madigan Dam No. 14-2. City of Vallejo, owner; earth, situated on Wild Horse Creek tributary to Green Valley Creek in Sec. 9, T. 5 N., R. 3 W., M. D. B. and M.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of August, 1931.

YUBA COUNTY—Lake Francis Dam No. 97-3. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Dobbins Creek tributary to Yuba River in Sec. 5, T. 17 N., R. 7 E., M. D. B. and M.

NEVADA COUNTY—White Rock Dam No. 97-49. Pacific Gas and Electric Company, San Francisco, owner; earth and rock dam, situated on North Creek tributary to Fordsyke, in Sec. 22, T. 18 N., R. 14 E., M. D. B. and M.

ALPINE COUNTY—Twin Lakes Dam No. 97-59. Pacific Gas and Electric Company, San Francisco, owner; arch dam, situated on branch of Silver Creek tributary to South Fork American River in Sec. 22, T. 10 N., R. 17 E., M. D. B. and M.

SANTA CLARA COUNTY—Lower Howell Dam No. 622-2. San Jose Water Works, San Jose, owner; earth dam, situated on Russell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

FRESNO COUNTY—Florence Lake Dam No. 104-9. Southern California Edison Company, Los Angeles, owner; multiple arch, situated on South Fork San Joaquin River tributary to San Joaquin in Sec. 1, T. 8 S., R. 27 E., M. D. B. and M.

PLACER AND SACRAMENTO COUNTIES—Diversion Dam No. 324. North Fork Ditch Company, Sacramento, owner; gravity, situated on North Fork American River tributary to American River in Sec. 23, T. 12 N., R. 8 E., M. D. B. and M.

TUOLUMNE COUNTY—Kincaid Dam No. 97-72. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on a small creek tributary to Curtis Creek in Sec. 9, T. 1 N., R. 15 E., M. D. B. and M.

EDWARD HYATT, State Engineer.

September 1, 1931.

A Chinese editor inclosed a rejection slip, when returning contributions, which read as follows:

"We have read your manuscript with infinite delight. Never before have we reveled in such a masterpiece. If we printed it the authorities would take it for a model and henceforth would never permit anything inferior to it. As it would be impossible to find its equal within 10,000 years, we are compelled though shaken with sorrow, to return your divine manuscript, and for so doing we beg 10,000 pardons."

—Pittsburgh Chronicle-Telegraph

In the Realm of Women—With a Hoe



SOCIETY SECTION! Having to do with the activities of the wife of a Maintenance Superintendent, Mrs. Tremper. Without expense to the State she has turned the place on the left into the beautiful home on the right. Some gardener!

Flowers and Blooms Win Recognition for R. A. Tremper's Wife

R. A. Tremper is the Maintenance Superintendent for District II. As such, he's pretty hard to beat.

But Mrs. Tremper—there's a Maintenance Superintendent!

When Mrs. Tremper moved into the cottage shown in the picture in 1927—well, it was a shelter alright but little else.

And now, four years later, the gardens surrounding her home are among the show places of Boulder Creek and its vicinity.

By constant work and perseverance, diligence and care, Mrs. Tremper has turned the grounds surrounding the Maintenance Yard into a veritable forest of bloom and color. Especially in the spring and the greater part of summer is to be found a riot of beautiful flowers and blossoms.

Under direction and advice of State Landscape Engineer H. D. Bowers, Maintenance Yard foremen and State highway employees are being encouraged to beautify State property. In several sections of California are to be found attractive gardens and lawns planted in spare time by State employees.

Mrs. Tremper's effort stands out, however.



SHADY NOOKS—Another view of the Boulder Creek home of the Tremper's, giving a further idea of the intensive work done to beautify the place.

"Times certainly have changed," sighed Carleton.

"How so?" asked Herz.

"Why, at a little party last night, the women talked politics, while the men got off in a corner and exchanged recipes."

Small boy (to his father): The world is round, isn't it?

Father: It is.

Boy: Then if I wanted to go east I could get there by going west, couldn't I?

Father: Yes, and when you grow up you will be a taxicab driver.—*National Motorist*.

A stranger applied at the police station for a lodging, and when asked his name, replied that it was Smith.

"Give me your real name," he was ordered.

"Well, said the applicant, "put me down as William Shakespeare."

"That's better," the officer told him. "You can't bluff me with that Smith stuff."—*Tit-Bits*.

"Do you know Vandewater has eleven children?"
"He's gone stork mad, hasn't he?"—*Exchange*.

Water Masters Regulate Rivers' Flow

(Continued from page 31)

Salinity Test's Sacramento-San Joaquin Delta—Continued

Station	Salinity in parts of chlorine per 100,000	
	8, 10/31	8, 10/24
Three-Mile Slough Bridge.....	760	578
Rio Vista Bridge.....	700	572
Isleton.....	510	300
Howard Ferry.....	400	81
Walnut Grove.....	200	42
Hood Ferry.....	8	46
Jersey.....	700	550
Webb Pump.....	520	
Central Landing.....	370	180
Middle River Post Office.....	130	82
Williams Bridge.....	52	

The Feather River situation has called for considerable activity. The river went dry at Nicolaus on July 10 with several large diversions below Marysville depending on its flow. Conditions were investigated by the Water Supervisor's office and a meeting of a number of the lower water users was held in the State Engineer's office on July 21, and the State Engineer conducted a similar meeting at Oroville on July 22 at which the larger water users and representatives of the Sutter-Butte Canal Co., Western Canal Co., Pacific Gas and Electric Co., and the Railroad Commission were present.

ECONOMIES MADE

As a result of these meetings the Pacific Gas and Electric Co. released additional storage from Bucks Reservoir, the Sutter-Butte Canal Co. and Western Canal Co. made certain cuts in their diversions and water was sent down the river to a point below the Nicolaus bridge.

An agreement providing for a State Water Master to regulate diversions in accordance with reasonable duty of water and crop requirements was presented to the water users and signed by them. This water master under the direction of the Water Supervisor's office began work July 23. A schedule of rotation among the general crop diverters was placed in effect. Subsequently it was found that additional storage releases would be necessary to reach the pumps of the Sutter Basin Co. below Nicolaus, and through representations of this company to Pacific Gas and Electric Co., and in view of the fact that the distribution of water was under the control of the State Water Master, the power company released a large additional flow from Lake Almanor beginning July 30, 1931. This flow reached the Sutter Basin pumps.

Up to the present time through close regulation by the water master and cooperation on the parts of the Sutter-Butte Canal Co. and Pacific Gas and Electric Co., the water users have been successfully supplied. It appears probable that the Feather River situation may lead to an action for ultimate adjudication of the water rights on the river below Oroville.

CALIFORNIA COOPERATIVE SNOW SURVEYS

A small amount of office work has been done in continuation of that reported last month in relating snow survey and precipitation data to run-off. Other office work included the preparation of plans and

specifications for standard frame and log shelter cabins. A trip was made in cooperation with officials of Nevada Cooperative Snow Surveys to inspect the snow courses of the Walker River Basin. Many of the courses required clearing and all of them were re-marked with the new California cooperative signs and accurate sketches and descriptions of the courses were secured.

FEDERAL COOPERATION

In connection with the Federal-State cooperation for irrigation investigations a review was made of the report of 1930 work in the Sacramento-San Joaquin Delta. The report has been prepared for incorporation in the regular 1930 report of the Water Supervisor. There has been some discussion relative to the conduct of the investigation to determine the consumptive use of aquatic plants, and the results up to August 1, 1931, for the tule and cattail tanks have been received and reviewed.

In connection with the Federal-State cooperation for stream-gaging, a tentative program for the quality of water investigation throughout the State has been outlined and submitted to the U. S. Geological Survey for an estimate of cost. A trip was made to the Pit River Basin for the inspection of gaging stations that have been maintained up to the present under the State's Pit River Investigation. Four stations were selected for permanent maintenance by the U. S. Geological Survey after the close of the Pit River investigation.

A trip was made for the selection of sites for permanent gaging station installations on the Feather River at Nicolaus (replacing present weekly recorder) and on the Sacramento River just below Wilkins Slough. These two stations will be built by the U. S. Engineers, Second District, in accordance with cooperative arrangement between the State and Federal departments.

SACRAMENTO FLOOD CONTROL

The weir in the Wadsworth Canal, built for the Reclamation Board, has been completed and water is now being held to about one-half full height. An additional week will be allowed for the concrete to attain full strength before water will be carried to the final elevation. The pavement over the fills at the ends of the dam will not be placed until the fill is completely settled.

RUSSIAN RIVER JETTY

Bids were received for the construction of 225 feet of trestle for the railroad tract to extend the jetty, and contract was awarded to the Healy-Tibbitts Construction Company at a price of \$9,743. The contractor has commenced work and piles are being driven. This contract provides for the use of steel piles.

Irrigation Cooperation is Outlined

(Continued from preceding page)

DAMS

To date 771 applications for approval of existing dams have been filed; 76 for approval of plans and specifications for construction or enlargement; and 170 for approval of repairs or alterations.

a. Applications Received for Approval of Plans and Specifications for Construction of Dams.

Dam	Owner	County
North Side Water Company	North Side Water Co.	Los Angeles
San Vicente Creek	Coast Dairies and Land Co.	Santa Cruz
La Patera	Sherman P. Stow Co.	Santa Barbara
Cascade Creek	Humphrey Estate Co.	San Mateo

b. Applications Received for Approval of Plans for Repair or Alterations.

Dam	Owner	County
Lower Howell	San Jose Water Works	Santa Clara
White Rock	Pacific Gas and Electric Co.	Nevada
Florence Lake	Southern California Edison Co.	Fresno
Mocking Bird	Gage Canal Co.	Riverside
Kincaid	Pacific Gas and Electric Co.	Tuolumne
Baldwin	Pacific Gas and Electric Co.	Shasta
Diversion	North Fork Ditch Co.	Placer and Sacramento

c. Plans Approved for Repairs or Alterations.

Dam	Owner	County
Port Costa Balancing Reser.	California Water Service Co.	Contra Costa
Spaulding No. 1	R. D. Craig	Modoc
Alta Forebay	Pacific Gas and Electric Co.	Placer
Lake Strawberry	Pacific Gas and Electric Co.	Tuolumne
Relief	Pacific Gas and Electric Co.	Tuolumne
Duke Reservoir	Royal E. Williams	Modoc
Lake Francis	Pacific Gas and Electric Co.	Yuba
White Rock	Pacific Gas and Electric Co.	Nevada
Twin Lakes	Pacific Gas and Electric Co.	Alpine
Lower Howell	San Jose Water Works	Santa Clara

Orders Authorizing Use

Orders authorizing use of the following dams pending formal approval, have been issued by the State Engineer.

Dam	Owner	County
Whittier	City of Whittier	Los Angeles
Sunset Canyon	L. A. Co. Flood Control Dist.	Los Angeles

WATER RIGHTS

a. Applications to Appropriate.

During the month of July, 36 applications were received for the appropriation of water; 8 were canceled and 20 were approved; 9 permits were revoked and 16 licenses issued.

Applications which were of special interest received during the month included one from the East Side Canal and Irrigation Company seeking the appropriation of 75 cubic feet per second from McCoy Spillway, Arena Spillway, Livingston Drain, Bear, Owens, Duck and Deadman creeks for the irrigation of some 50,000 acres in Merced County; and another from C. L. Brown, 600 S. Madison street, Pasadena, seeking the appropriation of 100 cubic feet per second

from Canyon Creek at a point some 12 miles northwest of Weaverville for mining and domestic purposes, the estimated cost of this latter project being \$150,000. During the month a second project for mining and domestic purposes and estimated to cost \$150,000 received a permit. This latter project involves the appropriation of 150 cubic feet per second from various small tributaries of Trinity River in the vicinity of Willow Creek.

b. Adjudications.

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). A hearing on the exceptions to the Division's report as referee has been set by the Superior Court for October 5, 1931.

Los Alamos Creek (Santa Barbara County). Division's report as referee has been submitted to the Superior court and a decree is expected in the near future.

Mill Creek (Modoc County). All but two of the water users have signed a stipulation for consent judgment.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted for the 1931 season.

WATER DISTRIBUTION

Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl, Pine and Soldier Creeks (Modoc County). Water master service on these streams was continued throughout the month.

South Fork of Pit River (Modoc County). Supervision over diversions from the South Fork of Pit River was commenced August first, under authority of an agreement signed by all of the water users involved.

Parker Creek (Modoc County). Supervision over diversions from Parker Creek was commenced August fourth, under authority of a court order issued July 31, 1931, directing water master service under a former court decree.

North Fork of Cottonwood Creek (Shasta County). A petition for water master service within the North Fork of Cottonwood Creek Water District was received on August sixth. Supervision over diversions from the stream was commenced immediately thereafter.

WATER RESOURCES

b. Santa Clara Investigation. The Santa Clara Valley Water Conservation District with which the division is cooperating in the Santa Clara Valley Investigation is contemplating an election upon the issuance of bonds with which to finance the construction of conservation facilities. An engineer has been

State Water Plan Meetings Held

(Continued from preceding page)

employed and work of preparing estimates is in progress. The district has, however, expressed a desire that the division continue with the investigation along the lines of the past 18 months. Well readings taken throughout the valley early last spring indicated a recession of some 76½ feet in the ground water during the past 16 years, 12 feet of which occurred during the last 12 months. This recession of ground water it is estimated indicates a gross depletion of underground storage amounting to 700,000 acre-feet during the past 16 years, of which 110,000 acre-feet occurred during the last 12 months.

WATER RESOURCES REPORTS

During the month, the following has been accomplished on the publications of the Division of Water Resources under Chapter 832, Statutes of 1929:

Work has progressed on the preparation of manuscript of bulletins No. 26, "Sacramento River Basin"; No. 27, "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay"; and No. 29, "San Joaquin River Basin." Manuscript on Bulletin No. 28, "Economic Aspects of a Salt Water Barrier below Confluence of Sacramento and San Joaquin Rivers," has been completed and transmitted to the Consulting Board for final corrections and revisions.

Bulletin No. 23, "Rainfall Penetration and Consumptive Use of Water in Santa Ana River Valley and Coastal Plain," has been printed. This bulletin is a progress report of cooperative activities carried on by the Division of Agricultural Engineering, Bureau of Public Roads of the U. S. Department of Agriculture. The report was prepared by H. F. Blaney, assisted by A. A. Young and C. A. Taylor under the supervision of W. W. McLaughlin, Associate Chief. The publication contains some 160 pages written in two parts. Part I deals with "Rainfall Penetration and Consumptive Use of Water on Valley Floors," and gives outlines of methods of procedure and the data collected to July 1, 1930, on numerous plots of varied vegetation in the Santa Ana Valley. Part II deals with "Evaporation and Transpiration Losses from Moist Areas," and sets forth the results of tank and field experiments carried on in the Santa Ana Valley. The work outlined in this bulletin is being continued under Chapter 636 of the Statutes of 1929 to obtain more complete data on the needs for and the conservation of the water resources of the Santa Ana Valley, with particular reference to rainfall and its uses and losses from cultivated and native vegetation.

The following bulletins are now printed and are available for distribution:

Bulletin No. 25—"Report to Legislature of 1931 on State Water Plan."

Bulletin No. 28A—"Industrial Survey to Upper San Francisco Bay Area With Special Reference to a Salt Water Barrier Below Confluence of Sacramento and San Joaquin Rivers."

Bulletin No. 31—"Santa Ana River Basin."

Bulletin No. 32—"South Coastal Basin."

Bulletin No. 33—"Rainfall Penetration and Consumptive Use of Water in Santa Ana River Valley and Coastal Plain."

Bulletin No. 34—"Permissible Annual Charges for Irrigation Water in Upper San Joaquin Valley."

Bulletin No. 35—"Permissible Economic Rate of Irrigation Development in California."

Bulletin No. 36—"Cost of Irrigation Water in California."

LEGISLATIVE COMMITTEE

Authorized under Chapter 71, Senate Concurrent Resolution No. 28, the Joint Legislative Committee on Water Resources, consisting of fourteen members, Senator B. S. Crittenden, Chairman, met in a series of public hearings and executive sessions in the State Building, Civic Center, San Francisco, from August 6th to August 15th, inclusive, during which time a large number of individuals appeared to submit views and opinions on the State Water Plan.

WATER STORAGE DISTRICTS

Of the large number of laws passed by the 1930-31 Legislature, affecting California irrigation districts and similar organizations throughout the State, the most important was the California Districts Securities Commission Act, which repealed the Bond Commission Act of 1913. The securities act provides for a commission of five members, consisting of the Attorney General, State Engineer, Superintendent of Banks and two members to be appointed by the Governor, each of whom shall have had at least five years' experience in irrigation district affairs as an officer or employee. The act defines the duties of the Commission in relation to the bonds of irrigation districts, and under what condition such bonds may be issued and certified as legal investments for public and trust funds. It also provides for certain activities of the Commission in the refinancing of districts and in the readjustment of the financial affairs of insolvent irrigation districts. The Commission as now constituted consists of U. S. Webb, Attorney General; Edward Rainey, Superintendent of Banks; Edward Hyatt, State Engineer; M. J. Dowd, Chief Engineer of Imperial Irrigation District; and H. E. Vogel, Director of Fresno Irrigation District.

An initial and organization meeting of the Commission was held at San Francisco on August 19th, at which Attorney General Webb was elected permanent chairman. At this meeting the refunding programs of the Oakdale and South San Joaquin irrigation districts were given consideration and approval. The action of the Commission does not carry with it the authority for the issuance of bonds, which authority is conditioned on the approval of the plan by the voters of the district at special bond elections.



CONTRACTING THE AIR. Hemstreet & Bell literally drop in on their men nowadays. For they have purchased an airplane and do their inspecting of contract work via this modern medium. The photograph shows (left to right) D. A. Hemstreet and J. W. Bell with Mr. Allen, the pilot, taking a breather before embarking again on a scheduled trip to their various projects.

NOW COMES the contractor who frankly admits he's "up in the air" most of the time.

Of course there are engineers who think most contractors are "up in the air" ALL of the time.

But Hemstreet & Bell of Marysville do most of their work while up in the air.

For they have purchased an airplane for the contracting business.

Thus is demonstrated a modern means of increasing efficiency by permitting closer supervision of scattered jobs and giving directing heads of the organization more time for active and constructive work.

For example:

Hemstreet & Bell have an asphalt plant at Singley, near the bar on the Eel River. Here asphalt treated crushed gravel is being produced for a surfacing job between Lofeta and Eureka.

For the purpose of inspecting and directing the operations on this contract and to make field studies of a project adjacent to Crescent City and another near Scotia, upon both of which the firm desired to prepare bids, the contractors left headquarters at Marysville after breakfast one morning last week.

They landed at the Eel River Bar at 9.30 a.m. At eleven o'clock, they left for Crescent City, spent two hours inspecting the proposed

job there and landed at Singley again at 3.30 p.m. One hour and a half was spent inspecting the proposed work at Scotia and some additional time at the Singley plant.

The contractors left about 5.30 and reached Marysville again before seven o'clock.

Moral—Nothing to do till tomorrow.

CARE BY DRIVERS

Constant watchfulness against the possibility of injuring a person or causing property damage is required of motorists, according to a ruling of the Supreme Court in an eastern state received by the California State Automobile Association. The decision held that a motorist who sees a car stop at the side of the highway must bring his own car immediately under control and take every reasonable precaution in passing the parked car to avoid injuring any person who might get out of the machine, or who might attempt to cross the highway in front of the motorist.

AUTOS IN FRANCE

While still ranking third in the total number of automobiles, France last year achieved the greatest percentage of increase in registration. France made an increase of 13.5 per cent, as compared with 0.5 per cent for the United States. In car totals the United States headed the list with 26,691,000, followed by Great Britain with 1,558,000, and France with 1,500,000. There is one car in France to every 28 persons and one to every 4.6 persons in this country.

The Golfer: They're all afraid to play me. What do you think my handicap is?

The Girl: Oh, I don't know. It may be your face.

Highway Bids and Awards for August

AMADOR COUNTY—Between Amador City and Martell, stockpiling crushed gravel. Dist. X, Rt. 65, Sec. B, C. E. Reed, Tracy, \$9,600. Contract awarded to Adams Construction Co., Angels Camp, \$8,100.

BUTTE COUNTY—Between Shasta Union School and 6 miles north, 6.6 miles to be widened with bituminous treated crushed gravel or stone. Dist. III, Rt. 3, Sec. D, Hemstreet & Bell, Marysville, \$30,290; A. Teichert & Son, Sacramento, \$28,992; Harms Bros., Galt, \$27,930; Clark & Henery Construction Co., San Francisco, \$30,386; F. W. Nighbert, Bakersfield, \$33,049. Contract awarded to United Contracting Co., Portland, \$26,952.

DIL NORTE COUNTY—Between Crescent City and one-half mile east of Elk Valley, 5.1 miles to be graded and surfaced with untreated crushed gravel. Dist. I, Rt. 1, Sec. C, Interstate Construction Co., Portland, Ore., \$115,297; Kern & Kibbe, Portland, Ore., \$131,311; W. H. Hauser, Oakland, \$154,740; Kennedy Construction Co., Oakland, \$115,781; Frank C. Cuffe, San Rafael, \$127,446; H. J. Boomer, San Francisco, \$134,196; Daniel Eyles, Biggs, \$143,469; Hemstreet & Bell, Marysville, \$119,565; Condules Const. Co., San Francisco, \$127,790; A. Guthrie & Co., Inc., Portland, Ore., \$140,370; C. T. Malcom, Mapleton, Ore., \$149,860; Steele Finley, Santa Ana, \$116,580. Contract awarded to Healy-Tibbitts Construction Co., San Francisco, \$113,969.

EL DORADO COUNTY—Between 14 Mile Stone and Fresh Pond, 3.2 miles to be surfaced with bituminous treated crushed gravel. Dist. III, Rt. 11, Sec. F, Fred W. Nighbert, Bakersfield, \$18,327; A. Teichert & Son, Inc., Sacramento, \$14,420; Chas. N. Chittenden, Napa, \$14,366; Tiffany-McReynolds, Tiffany, San Jose, \$18,257; Harms Bros., Galt, \$14,340. Contract awarded to C. E. Reed, Tracy, \$12,745.

HUMBOLDT COUNTY—Between Red Crest and Holmes Road, untreated crushed gravel or stone surfacing 1.4 miles. Dist. I, Rt. 1, Sec. D, Smith Bros., Eureka, \$10,811; J. W. Bertram, \$10,857. Contract awarded to Delose C. Kemp, Crescent City, \$7,740.

HUMBOLDT COUNTY—Between S. Scotia Bridge and Fortuna, 10.2 miles grading surfacing. Dist. I, Rt. 1, Secs. E, F, Healy-Tibbitts Construction Co., \$149,294; W. H. Fouser, Oakland, \$147,096. Contract awarded to Hemstreet & Bell, Marysville, \$118,323.

HUMBOLDT COUNTY—Bridge across the east branch of the South Fork of Eel River, 2.7 miles south of Garberville, consisting of one 102-foot concrete barrel arch span and two 46-foot concrete girder approach spans with walls faced with stone. Dist. I, Rt. 1, Sec. A, Peter McHugh, San Francisco, \$108,122; Smith Bros. Co., Eureka, \$97,936; M. B. McGowan, San Francisco, \$119,454. Contract awarded to Rocca & Coletti, San Rafael, \$86,320.

LAKE AND COLUSA COUNTIES—Between Abbott Mine and 12 miles west of Williams, surfacing with gravel base. Dist. III, Rt. 15, Secs. C, D, C. W. Wood, Stockton, \$59,719; C. Anili Co., Huntington Park, \$84,966; Hemstreet & Bell, Marysville, \$73,350; Larsen Bros., Galt, \$59,850; Force Construction Co., Piedmont, \$55,122; A. Teichert & Son, Sacramento, \$56,909; F. W. Nighbert, Bakersfield, \$92,906; Clark & Henery Construction Co., San Francisco, \$78,508. Contract awarded to Frederickson & Watson, Oakland, \$50,905.

LOS ANGELES COUNTY—Reinforced concrete bridge across Fern Canyon about 5 miles northeast of La Canada, consisting of one 120-foot open spandrel arch and seven 135-foot slab approach spans. Dist. VII, Rt. 61, Sec. A, General Engineering Corp., Los Angeles, \$35,474; Oberg Bros., Los Angeles, \$26,690; R. H. Travers, \$32,137; Franklin B. Gridley, Pasadena, \$32,999; Robinson Roberts Co., Los Angeles, \$29,153. Contract awarded to Houghton & Anderson, Los Angeles, \$23,958.

Gasoline consumption in the United States increased 5.3 per cent in 1930.

During the first six months of this year motor vehicle registration in San Mateo County brought the total for that area to 26,197. Passenger automobiles totaled 24,521, with the remainder consisting of various other types of vehicles, such as trucks, trailers, and motorcycles.

MONTEREY COUNTY—At the Spence Underpass about 0.2 of a mile from the State Highway to the county road grading and surfacing with crusher run base and bituminous treatment. Dist. V, Rt. 2, Sec. B, Granite Construction Co., Watsonville, \$4,110. Contract awarded to W. A. Dontanville, Salinas, \$3,461.

MONTEREY COUNTY—Reinforced concrete bridge across Bixby Creek, 18 miles south of Carmel, consisting of one 330-foot open spandrel arch span and nine 40-foot girder approach spans. Dist. V, Rt. 56, Sec. G, Geo. Pollock Co., Sacramento, \$212,975; Barrett & Hip, San Francisco, \$234,067; Hanrahan Co., San Francisco, \$286,432; Lindgren & Swinerton, San Francisco, \$257,400; Rocca & Coletti, San Rafael, \$269,103; Gutleben Bros., Oakland, \$216,575; Merritt-Chapman & Scott, San Pedro, \$258,000; Fredrickson & Watson Construction Co., Oakland, \$233,151; Guy F. Atkinson, San Francisco, \$228,650; Oberg Bros., Los Angeles, \$218,400; Weves & Harp, Santa Clara, \$265,475; MacDonald & Kahu Co., San Francisco, \$237,360. Contract awarded to Ward Engineering Co., San Francisco, \$203,334.

ORANGE COUNTY—Pedestrian subway under State Highway and tracks of Pacific Electric Ry. Dist. VII, Rt. 60, Sec. A, Need Construction Co., Wilmington, \$14,322; R. R. Bishop, Los Angeles, \$11,485; W. M. Ledbetter Los Angeles, \$14,852; Franklin B. Gridley, Pasadena, \$17,435. Contract awarded to E. A. Irish, Los Angeles, \$11,026.

ORANGE COUNTY—Bridge across north arm of Newport Bay, near Newport Beach, one 12-foot steel stringer removable span and thirty-four 19-foot timber spans with concrete deck on crescented pile bents. Dist. VII, Rt. 60, Sec. B, R. H. Travers, Los Angeles, \$71,345; George Herz Co., San Bernardino, \$72,119; Need Construction Co., Wilmington, \$69,935; General Emergency Corp., Los Angeles, \$78,242; Robinson Roberts Co., Los Angeles, \$76,278; R. R. Bishop, Long Beach, \$72,462; W. J. O'Neil, San Francisco, \$67,446; Merritt-Chapman & Scott, San Pedro, \$69,244. Contract awarded to J. S. Metzger & Son, San Gabriel, \$65,249.

PLUMAS COUNTY—Steel stringer bridge across Spanish Creek about 1.5 miles north of Keddie, Dist. II, Rt. 21, Sec. C, R. B. McKenzie, Red Bluff, \$102,852; Barrett & Hip, San Francisco, \$105,550; Robinson, Roberts Co., Los Angeles, \$103,479; Dyer Bros. Golden West Iron Works, San Francisco, \$102,049; M. B. McGowan, San Francisco, \$103,356; A. W. Kitchen, San Francisco, \$111,272. Contract awarded to Rocca & Coletti, San Rafael, \$92,780.

SAN BENITO COUNTY—Between 11 miles north of San Juan Bautista and Pajaro River, 3.1 miles shoulders to be oiled. Dist. V, Rt. 2, Sec. A, W. A. Dontanville, Salinas, \$6,908. Contract awarded to Granite Construction Co., Watsonville, \$5,984.

SAN DIEGO COUNTY—At Jacumba, 1.1 miles grading, paving with Portland cement concrete. Dist. VII, Rt. 12, Sec. G, Gist & Bell, Arcadia, \$109,551; D. B. Carroll, San Diego, \$123,024; George Herz & Co., San Bernardino, \$114,794; E. Paul Ford, San Diego, \$112,404; Matich Bros., Elsinore, \$117,019; Frank Moran, San Diego, \$123,646. Contract awarded to Walter Trepte, San Diego, \$106,704.

SAN LUIS OBISPO COUNTY—Between Hathaway Ave. and the California Polytechnic School, 0.6 of a mile to be graded and surfaced with bituminous macadam. Dist. V, W. A. Dontanville, Salinas, \$8,188; Wm. Raisch, San Luis Obispo, \$9,215; Santa Maria Construction Co., Santa Maria, \$9,368; Granite Construction Co., Watsonville, \$10,801. Contract awarded to Henry C. Dalessi, San Luis Obispo, \$8,023.

SANTA BARBARA COUNTY—Between Gaviota Canyon and Tecolote Creek, 9.6 miles crusher run borders. Dist. V, Rt. 2, Secs. E, F, and G, Santa Maria Construction Co., Santa Maria, \$30,855; Granite Construction Co., Watsonville, \$30,469. Contract awarded to Gist & Bell, Arcadia, \$29,425.

SANTA BARBARA COUNTY—Between Gaviota Pass and Zaca, 6.1 miles existing shoulders to be oiled treated. Dist. V, Rt. 2, Sec. D, Granite Construction Co., Watsonville, \$5,160; W. A. Dontanville, Salinas, \$5,295. Contract awarded to Santa Maria Construction Co., Santa Maria, \$4,200.

Highway Awards

Continued from preceding page

SANTA BARBARA COUNTY—Between Zaca and Wignmore, about 4 miles of existing shoulders to be oiled. Dist. V, Rt. 2, Sec. C, Granite Construction Co., Watsonville, \$5,569; W. A. Dontanville, Salinas, \$4,890. Contract awarded to Santa Maria Construction Co., \$4,200.

SANTA CLARA COUNTY—Between Gilroy and Pajaro River, 5.2 miles to have rock borders to be placed. Dist. IV, Rt. 2, Sec. C, Harris Bros., Galt, \$15,333; W. A. Dontanville, Salinas, \$12,329. Contract awarded to Granite Const. Co., Watsonville, \$10,538.

SHASTA COUNTY—Between Diddy Hill and Montgomery Creek, 9.3 miles to be surfaced with untreated crushed gravel or stone and material stockpiled. Dist. II, Rt. 28, Secs. A, B, C, N. M. Ball, Porterville, \$88,867; Hein Bros. & Basalt Rock Co., Petaluma, \$84,688; Fred W. Nighbert, Bakersfield, \$92,825; A. Milne, Portland, \$92,825; E. B. Bishop, Sacramento, \$88,850. Contract awarded to Hemstreet & Bell, Marysville, \$81,465.

TULARE COUNTY—Between Tipton Crossing and Tulare, 7.6 miles to be graded and paved with Portland cement concrete. Dist. VI, Rt. 4, Sec. B, Basich Bros., Torrance, \$287,920; Southern California Road Co., Los Angeles, \$311,905; Jahn & Bressi, Los Angeles, \$297,988; Peninsula Paving Co., San Francisco, \$312,761; Hanrahan Co., San Francisco, \$299,649; Valley Paving & Construction Co., Fresno, \$305,674; N. M. Ball & D. McDonald, Sacramento, \$300,664; C. W. Wood, Stockton, \$310,145; M. J. Bevanda, Stockton, \$276,088; Fredrickson & Watson Construction Co., Oakland, \$302,033; Gibbons & Reed Co., Burbank, \$332,590; McCray Co., Los Angeles, \$306,503; Thompson Bros., Fresno, \$289,944. Contract awarded to Union Paving Co., San Francisco, \$274,283.

TULARE COUNTY—Five reinforced concrete bridges between Tipton Crossing and Tulare, varying from 48 feet to 300 feet long. Dist. VI, Rt. 4, Sec. B, Jahn & Bressi, Los Angeles, \$51,446; Peninsula Paving Co., San Francisco, \$53,096; Hanrahan Co., San Francisco, \$53,458; George J. Ulrich Construction Co., Modesto, \$48,459; Merritt-Chapman & Scott, San Pedro, \$53,577; Bodenhamer Construction Co., Oakland, \$53,886; Fredrickson & Watson Construction Co., Oakland, \$48,559; C. Anil Co., Huntington Park, \$61,841; Oberg Bros., Los Angeles, \$57,585; Hartman Construction Co., Bakersfield, \$53,414. Contract awarded to J. S. Metzger & Son, Los Angeles, \$43,517.

VENTURA COUNTY—Undergrade crossing of S. P. Ry., about ½ mile west of El Rio. Dist. VII, Rt. 60, Sec. B, Silveria & Robbins, Ventura, \$74,850; Robinson Roberts Co., Los Angeles, \$79,845; Oberg Bros., Los Angeles \$74,781. Contract awarded to Merritt-Chapman & Scott, San Pedro, \$71,505.

Who Gets Tourists' \$\$\$? U.S. Analysis Shows Distribution

There seems to be some argument in various sections of the country among merchants as to who gets the tourist's dollar that may be spent in the community. The United States Department of Commerce has been making a study of this new industry and they give the following percentages as being about correct. It must be remembered that in some communities the actual figure will vary according to accommodations offered:

Retailer	25 per cent
Restaurant	20 per cent
Hotel or camp	17 per cent
Garage and filling station	12 per cent



MRS. JOHN H. SKEGGS, bride of Colonel John H. Skeggs of District IV, with headquarters in San Francisco. Mrs. Skeggs is the former Miss Ellanette Fagrellius of San Francisco, and was engaged in real estate activities before her marriage July 2d.

A young man who pleaded "joy riding" because he borrowed a car to meet his best girl and wanted to show off, got twelve months' hard labor. Courting trouble.—*National Motorist*.

A husband said to his wife: "I read here that 'Woman, without her man, is a savage.'"

She looked over his shoulder and said: "Now read that again."

And he read slower: "Woman! Without her, man is a savage."—*National Motorist*.

Transportation	10 per cent
Theaters and amusement	10 per cent
Confectionery	6 per cent
Total	100 per cent

Usually the retailer is the first one to say that his sales are not affected by the tourist. He is overlooking the fact that in his case the money does not go from first spender to merchant. He gets his volume from the pay envelope of the employee of the filling station, garage, hotels and restaurants.

—*Roads and Streets*.

August Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources during the month of August, 1931.

TUOLUMNE COUNTY—Application 7025. Division of Highways, Sacramento, for 605 c.f.s. from Stoddard Springs tributary to North Fork of Tuolumne River to be diverted in Sec. 10, T. 3 N. R. 17 E., M. D. B. and M., for recreational purposes to supply public. Estimated cost \$200.

DEL NORTE COUNTY—Application 7026. Harry T. Wilkerson, 1268 S. Highland Ave., Los Angeles, for 50 c.f.s. from Hurdy Gurdy Creek tributary to South Fork of Smith River to be diverted in Sec. 19, T. 16 N., R. 3 E., H. B. and M., for mining and domestic purposes.

SIERRA COUNTY—Application 7027. T. W. Walther, c/o R. F. Taylor, Downieville, for 3.0 c.f.s. from Canyon Creek tributary to Yuba River to be diverted in Sec. 12, T. 21 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$1,500.

EL DORADO COUNTY—Application 7028. Lawrence E. Kinnear, 309 4th St., Antioch, for 200 gallons per day from unnamed stream tributary to South Fork of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

EL DORADO COUNTY—Application 7029. Lawrence W. Mehaffey, 611 6th St., Antioch, for 200 gallons per day from unnamed stream tributary to South Fork of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

FRESNO COUNTY—Application 7030. Ambrose A. Cowan, c/o James M. Thueran, Atty., Fowler, for 2 c.f.s. from Mill Flat Creek tributary to Kings River to be diverted in Sec. 5, T. 13 S., R. 27 E., M. D. B. and M., for irrigation purposes. Estimated cost \$250.

NEVADA COUNTY—Application 7031. South Yuba Company, Ltd., c/o C. H. Shaw, Hotel Whitcomb, San Francisco, for 50 c.f.s. from South Yuba River tributary to Yuba River to be diverted in Sec. 8, T. 17 N., R. 11 E., M. D. B. and M., for mining purposes. Estimated cost \$10,000.

PLACER COUNTY—Application 7032. Paul H. Norboc, Room 605, 127 Montgomery St., San Francisco, for 250 c.f.s. 200,000 acre-feet per annum from Middle Fork of American River tributary to Sacramento River to be diverted in Sec. 36, T. 15 N., R. 13 E., M. D. B. and M., for power purposes. Estimated cost \$18,000,000.

PLACER COUNTY—Application 7033. Paul H. Norboc, Room 605, 127 Montgomery St., San Francisco, for 250 c.f.s. 200,000 acre-feet per annum from Middle Fork of American River tributary to Sacramento River to be diverted in Sec. 36, T. 15 N., R. 13 E., M. D. B. and M., for municipal purposes. Estimated cost \$15,000,000.

HUMBOLDT COUNTY—Application 7034. James L. Skiffington, Dyerville, for 0.012 c.f.s. from Little Creek tributary to Bull Creek to be diverted in Sec. 19, T. 1 S., R. 2 E., H. B. and M., for recreational purposes.

SAN DIEGO COUNTY—Application 7035. Marian Weber, Polomar Mountain, for 0.05 c.f.s. from springs tributary to Cutca Creek to be diverted in Sec. 29, T. 9 S., R. 1 E., S. B. B. and M., for domestic and irrigation purposes. Estimated cost \$1,000.

EL DORADO COUNTY—Application 7036. Geo. W. Harter and Mrs. W. W. Belshaw, c/o Geo. W. Harter, Antioch, for 400 gallons per day from a spring tributary to South Fork of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

VENTURA COUNTY—Application 7037. Evelyn Akin Robertson, P. O. Box 297, Ventura, for 1.0 c.f.s. from unnamed spring tributary to Cuyama River to be diverted in Sec. 12, T. 7 N., R. 24 W., S. B. B. and M., for recreational and domestic purposes. Estimated cost \$300.

SAN DIEGO COUNTY—Application 7038. United States, Cleveland National Forest, 310 Federal Bldg.,

San Diego, for 0.066 c.f.s. from Vallecitos Spring tributary to Vallecitos Creek to be diverted in Sec. 34, T. 14 S., R. 5 E., S. B. E. and M., for domestic purposes. Estimated cost \$2,000.

SANTA CLARA COUNTY—Application 7039. Santa Clara Valley Water Conservation District, c/o Herbert D. Jones, atty., Auzeais Bldg., San Jose, for 200 c.f.s. and 60,000 ac. ft. per annum from Coyote River tributary to San Francisco Bay to be diverted in Sec. 10, T. 9 S., R. 3 E., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$1,600,000.

SANTA CLARA COUNTY—Application 7040. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 30 c.f.s. and 9000 ac. ft. per annum from Arroyo Calero River tributary to Alamitos Creek to be diverted in Sec. 31, T. 8 S., R. 2 E., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$380,000.

SANTA CLARA COUNTY—Application 7041. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 30 c.f.s. and 6000 ac. ft. per annum from Almaden Creek tributary to Alamitos and Guadalupe Creek to be diverted in Sec. 10, T. 9 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$135,000.

SANTA CLARA COUNTY—Application 7042. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 45 c.f.s. and 100 ac. ft. per annum from Guadalupe Creek tributary to San Francisco Bay to be diverted in Sec. 9, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$53,000.

SANTA CLARA COUNTY—Application 7043. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 110 c.f.s. and 650 ac. ft. per annum from Los Gatos Creek tributary to Guadalupe Creek to be diverted in Sec. 10, T. 8 S., R. 1 W., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$109,000.

SANTA CLARA COUNTY—Application 7044. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 52 c.f.s. and 520 ac. ft. per annum from Los Gatos Creek tributary to Guadalupe Creek to be diverted in Sec. 35, T. 7 S., R. 1 W., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$57,500.

SANTA CLARA COUNTY—Application 7045. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 50 c.f.s. and 4000 ac. ft. per annum from Stevens Creek tributary to San Francisco Bay to be diverted in Sec. 27, T. 7 S., R. 2 W., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$350,000.

SANTA CLARA COUNTY—Application 7046. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 50 c.f.s. and 2000 ac. ft. per annum from Stevens Creek tributary to San Francisco Bay to be diverted in Sec. 4, T. 8 S., R. 2 W., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$146,000.

SANTA CLARA COUNTY—Application 7047. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 200 c.f.s. and 60,000 ac. ft. per annum from Coyote River tributary to San Francisco Bay to be diverted in Sec. 10, T. 9 S., R. 3 E., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$1,080,310.

SANTA CLARA COUNTY—Application 7048. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzeais Bldg., San Jose, for 50 c.f.s. and 3500 ac. ft. per annum from Guadalupe Creek tributary to San Francisco Bay to be diverted in Sec. 19, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and

Applications and Permits Granted

Continued from preceding page

domestic purposes. (133,000 acres.) Estimated cost \$377,170.

SANTA CLARA COUNTY—Application 7049. Santa Clara Valley Water Conservation District, c/o Herbert C. Jones, atty., Auzares Bldg., San Jose, for 20 c.f.s. and 1600 ac. ft. per annum from Calabazas Creek and Stevens Creek tributary to San Francisco Bay to be diverted in Sec. 34, T. 7 S., R. 2 W., M. D. B. and M., for irrigation and domestic purposes. (133,000 acres.) Estimated cost \$183,580.

PLACER COUNTY—Application 7050. R. A. Chipman, Nevada City, for 6.5 c.f.s. from Dutch Flat Canyon tributary to Bear River to be diverted in Sec. 34, T. 16 N., R. 10 E., M. D. B. and M., for mining purposes.

LAKE COUNTY—Application 7051. John R. Connelly, E. P. Smith and Stephen J. York, c/o John R. Connelly, Native Sons Bldg., Sacramento, for 0.1 c.f.s. and 5 ac. ft. per annum from unnamed spring tributary to Clear Lake to be diverted in Sec. 32, T. 15 N., R. 8 W., M. D. B. and M., for domestic purposes. Estimated cost \$2,500.

MENDOCINO COUNTY—Application 7052. H. M. Hartstone, Potter Valley, for 8000 gallons per day from Spicknard Spring tributary to Watenburg Creek, thence Eel River to be diverted in Sec. 25, T. 18 N., R. 12 W., M. D. B. and M., for irrigation and domestic purposes. (3 acres.) Estimated cost \$500.

MONO COUNTY—Application 7053. California Municipal Water Supply Co., Ltd., Riverside, for 200 c.f.s. from Lee Vining Creek tributary to Mono Lake to be diverted in Sec. 16, T. 1 N., R. 26 E., M. D. B. and M., for municipal and domestic purposes. Estimated cost \$40,000,000.

MONO COUNTY—Application 7054. California Municipal Water Supply Co., Ltd., Riverside, for 40 c.f.s. from (1) Walker Creek, (2) Gibbs Canyon Creek and (3) and (4) two unnamed streams between Walker Creek and Gibbs Canyon Creek tributary to Rush Creek to be diverted in Sec. (1) 5, T. 1 S., R. 26 E., M. D. B. and M., (2) in Sec. 21, T. 1 N., R. 26 E., M. D. B. and M., (3) in Sec. 32, T. 1 N., R. 26 E., M. D. B. and M., (4) in Sec. 33, T. 1 N., R. 26 E., M. D. B. and M. Estimated cost \$40,000,000.

MONO COUNTY—Application 7055. California Municipal Water Co., Ltd., Riverside, for 300 c.f.s. and 60,000 ac. ft. per annum from Rush Creek tributary to Mono Lake to be diverted in Sec. 26, T. 1 N., R. 26 E., M. D. B. and M., for municipal and domestic purposes. Estimated cost \$40,000,000.

MONO COUNTY—Application 7056. California Municipal Water Supply Co., Ltd., Riverside, for 40 c.f.s. from Parker and unnamed stream tributary to Rush Creek to be diverted in Sec. 9, T. 1 S., R. 26 E., M. D. B. and M., for municipal and domestic purposes. Estimated cost \$40,000,000.

LOS ANGELES COUNTY—Application 7057. Dr. Joseph A. Pollia, 269 S. Lake St., at W. Miramar, Los Angeles, for 0.135 c.f.s. from underground spring tributary to Mojave Desert Drainage Area to be diverted in Sec. 1, T. N., R. 11 W., S. B. B. and M., for irrigation and domestic purposes. (20 acres.) Estimated cost \$750.

TUOLUMNE COUNTY—Application 7058. United States, Stanislaus National Forest, Sonora, for 0.4 c.f.s. from North Fork of Tuolumne River tributary to Tuolumne to be diverted in Sec. 22, T. 4 N., R. 18 E., M. D. B. and M., for domestic purposes. Estimated cost \$5,000.

HUMBOLDT COUNTY—Application 7059. C. H. Barkdill, 417 Mutual Life Bldg., Seattle, Wash., for 50 c.f.s. from Mosquito Creek, Big Lake, Ammon Creek, Bear Trap and White Sides tributary to South Fork of Trinity River to be diverted in Secs. 33, 26, 27, 14 and 11, T. 5 N., R. 5 E., H. B. and M., for mining and domestic purposes.

TRINITY COUNTY—Application 7060. C. L. Brown, 600 S. Madison St., Pasadena, for 100 c.f.s. from Canyon Creek tributary to Trinity River, thence Klamath River to be diverted in Sec. 17, T. 35 N., R. 10 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$150,000.

HUMBOLDT COUNTY—Application 7061. Arthur McBride, Winford Ottley, Ralph Peters, c/o Allen and McNamara, attys., Yreka, for 10 c.f.s. from Five Mile Creek tributary to Klamath River to be diverted in Section 16, T. 11 N., R. 6 E., H. B. and M., for power purposes. (681 H.P.) Estimated cost \$1,200.

HUMBOLDT COUNTY—Application 7062. Arthur McBride, Winford Ottley, Ralph Peters and Geo. W. Smith, c/o Allen and McNamara, attys., Yreka, for 10 c.f.s. from Five Mile Creek tributary to Klamath River to be diverted in Sec. 16, T. 11 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$1,200.

BUTTE COUNTY—Application 7063. Richvale Irrigation District, c/o Frank S. Robinson, Civil Eng., Chico, for 15 c.f.s. from Dry Creek tributary to Butte Creek to be diverted in Sec. 6, T. 19 N., R. 2 E., M. D. B. and M., for irrigation purposes. (17,000 acres.) Estimated cost \$2,000.

HUMBOLDT COUNTY—Application 7064. Humboldt Creamery Association, c/o W. Ernest Dickson, atty., 1st Nat. Bank Bldg., Eureka, for 1 c.f.s. from Eel River tributary to Pacific Ocean to be diverted in Sec. 29, T. 3 N., R. 1 W., H. B. and M., for industrial purposes. Estimated cost \$500.

SAN LUIS OBISPO COUNTY—Application 7065. City of San Luis Obispo, c/o J. B. Lippincott, Engr., Petroleum Securities Bldg., Los Angeles, for 300 ac. ft. per annum from Salinas River tributary to Pacific Ocean to be diverted in Sec. 36, T. 29 S., R. 13 E., M. D. B. and M., for municipal purposes.

MONO COUNTY—Application 7066. Cy Williams, c/o Roy Boothe, Forest Supervisor, Bishop, for 200 gallons per day from Rock Creek tributary to Owens River to be diverted in Sec. 32, T. 4 S., R. 30 E., M. D. B. and M., for domestic purposes.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources during the month of August, 1931.

MONO COUNTY—Permit 3760, Application 6782. Emma G. Parker, Bridgeport, August 4, 1931, for 0.1 c.f.s. from an unnamed stream in Sec. 32, T. 4 N., R. 24 E., M. D. B. and M., for irrigation on 4 acres. Estimated cost \$580.

CONTRA COSTA COUNTY—Permit 3761, Application 6884. Associated Oil Company, San Francisco, August 4, 1931, for 14.56 c.f.s. from Hastings Slough in Sec. 14, T. 2 N., R. 2 W., M. D. M., for industrial and incidental domestic. Estimated cost \$30,000.

PLACER COUNTY—Permit 3762, Application 6931. Fred E. Lazenby, Ogden, Utah, August 6, 1931, for 12 c.f.s. from 7 unnamed fresh water springs in Sec. 1, T. 13 N., R. 6 E., M. D. M., for irrigation and domestic on 10 acres. Estimated cost \$500.

SISKIYOU COUNTY—Permit 3763, Application 6635. Buzzard Hill Mine, Inc., Happy Camp, August 6, 1931, for 12.5 c.f.s. from Independence Creek in Sec. 32, T. 15 N., R. 7 E., H. M., for power. 319 T. H. P. to be developed. Estimated cost \$12,000.

SISKIYOU COUNTY—Permit 3764, Application 6636. Buzzard Hill Mine Inc., Happy Camp, August 6, 1931, for .05 c.f.s. from Independence Creek in Sec. 32, T. 15 N., R. 7 E., H. M. for irrigation on 4 acres. Estimated cost \$2,000.

SISKIYOU COUNTY—Permit 3765, Application 6637. Buzzard Hill Mine, Inc., Happy Camp, August 6, 1931, for .25 c.f.s. from Independence Creek in Sec. 32, T. 15 N., R. 7 E., H. M. for domestic and mining. Estimated cost \$12,000.

SANTA BARBARA COUNTY—Permit 3766, Application 6906. Union Realty Co., Santa Barbara, August 7, 1931, for 10,080 g.p.d. from an unnamed stream in Sec. 11, T. 5 N., R. 28 W., S. B. M., for irrigation and domestic on 5 acres. Estimated cost \$1,200.

HUMBOLDT COUNTY—Permit 3767, Application 6181. Benbow Power Co., Benbow, August 12, 1931, for 1.2 c.f.s. from Fish Creek in Sec. 6, T. 5 N., R. 4 E., H. M., for municipal purposes. Estimated cost \$26,000.

(Continued on next page)

AN INACTIVE FUTURE

We'll surely be bored in the future
When we've no more forests to burn
And I know for spectacular action
Our spirits will tenderly yearn.

Now, mother and sister and brother,
Can throw lighted matches away;
Can jazz up the velvety twilight
And add to the heat of the day.

The hunter, the fisher, the tourist,
The toll of destruction may swell,
A campfire left burning untended,
Can raise unmistakable hell.

We're talking, and talking, and talking,
About the precautions we take,
But year after year in the forests
More havoc and ruin we make.

And each year the menace grows greater,
Our great, fragrant forests are few,
The watersheds dwindle and perish,
Our birds and our deer perish too.

And soon in the long weary summers
There'll be no more forests to burn,
So over those days of inaction
My spirit doth pensively yearn.

A. MERRIAM CONNER.

(Printed in the North Sacramento Tribune-
Progress, Aug. 20.)

APPLICATIONS AND PERMITS
GRANTED

(Continued from page 43)

LOS ANGELES COUNTY—Permit 3768, Application 6970. Harry M. Miller, Little Rock, California, August 12, 1931, for .05 c.f.s. from unnamed spring in Sec. 16, T. 4 N., R. 10 W., S. B. M., for domestic and irrigation on 2 acres.

SAN BERNARDINO COUNTY—Permit 3769, Application 6964. Robert M. Stapp, Lake Arrowhead, August 17, 1931, for 5170 g.p.d. from unnamed spring tributary to Little Bear Creek in Sec. 28, T. 2 N., R. 3 W., S. B. M., for domestic and recreational purposes. Estimated cost \$350.

HUMBOLDT COUNTY—Permit 3770, Application 6954. Peter H. Brandt, Fortuna, August 20, 1931, for 12,000 g.p.d. from Strong Creek in Sec. 2, T. 2 N., R. 1 W., H. M. for irrigation of 15 acres. Estimated cost \$500.

SIERRA COUNTY—Permit 3771, Application 6966. W. S. Coffin, Upland, August 21, 1931, for 3 c.f.s. from Rock Creek in Sec. 16, T. 19 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$600.

MONTEREY COUNTY—Permit 3772, Application 6804. Fort Klamath Meadows Co., Hollister, August 22, 1931, for 100 c.f.s. or 3 a.f. of irrigated land between October 1 and April 1 and or 10.87 c.f.s. between April 1 and October 1 of each season, total diversions shall not exceed 4000 a.f. in any one year from Peach Tree Creek in Sec. 12, T. 20 S., R. 10 E., M. D. M. for irrigation on 869.5 acres. Estimated cost \$3,000.

HUMBOLDT COUNTY—Permit 3773, Application 6849. Salyer Consolidated Mines Co., Salyer, August 25, 1931, for 50 c.f.s. from Campbell, Four Mile, Saxey, Deer Creek tributary to Trinity River in Secs. 16, 20 and 21, T. 6 N., R. 5 E., H. M. for mining purposes. Estimated cost \$200,000.

Remember Words of
Rolph; Says Paper

(Editorial in Byron Times)

Breaking all precedent by appealing to each and every citizen of California to lend his weight to a unified State water plan that will receive financial support from the Federal government, Governor Rolph has been the recipient of widespread acclaim.

His message is clear-cut and outlines in interesting detail what has already been accomplished toward the end that California may continue to progress and prosper.

The groundwork has been laid. Prominent legislators and citizens have been appointed. The congressional committee has been here and realizes the seriousness of the situation, and the California Water Resources Commission is now busy at work formulating such legislation as may be necessary and advisable to carry out a coordinated development of the waters of the State.

Each and every citizen now must do his and her part, remembering the words of Governor Rolph in his inaugural speech last January when he said, "we must not approach these problems in a narrow or sectional spirit."

Community leaders can accomplish much by visualizing the whole, and condemning selfish interests. It is in the hope that individuals will do so that the Governor has appealed to his 5,677,251 fellow Californians. Without their heartfelt sympathy and cooperation the water plan is doomed to failure. Each must do his part.

WARNINGS UNHEEDED

That motor vehicle accidents in traffic are preventable is indicated in the recent report of the State Railroad Commission showing that 52 per cent of the grade crossing fatalities in California last year occurred at crossings where warning signals notified motorists of approaching trains.

Drivers apparently were more careful at railroad crossings where no warnings were given, than where automatic signal devices have been installed.

Honey: That boy you were riding with has trouble with his vision?

Girl: Yeah, he sees parking spots before his eyes.
—State Lion.

There are more passenger automobiles in use in the United States than there are telephones, according to figures reported to the California State Automobile Association. There were 23,042,840 passenger cars on December 31, 1930, as compared with 20,098,059 telephones.

NEVADA COUNTY—Permit 3774, Application 6824. Gordon M. Bettles, Nevada City, August 25, 1931, for 3 c.f.s. from South Fork of Poorman Creek in Sec. 15, T. 18 N., R. 11 E., M. D. M., for power purposes. Estimated cost \$8,000.

STATE OF CALIFORNIA Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

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CALIFORNIA HIGHWAY COMMISSION

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HARRY A. HOPKINS, Taft

TIMOTHY A. REARDON, San Francisco

PHILIP A. STANTON, Anaheim

FRANK A. TETLEY, Riverside

C. H. PURCELL, State Highway Engineer, Sacramento

JOHN W. HOWE, Secretary

HUGH K. McKEVITT, Attorney, San Francisco

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T. E. STANTON, Materials and Research Engineer

FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

CHAS. E. ANDREW, Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Comptroller

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H. S. COMLY, District II, Redding

CHARLES H. WHITMORE, District III, Sacramento

J. H. SKEGGS, District IV, San Francisco

L. H. GIBSON, District V, San Luis Obispo

E. E. WALLACE, District VI, Fresno

S. V. CORTELYOU, District VII, Los Angeles

E. Q. SULLIVAN, District VIII, San Bernardino

F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
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Resources Investigation

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Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams

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EVERETT N. BRYAN, Hydraulic Engineer, Water
Rights

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H. M. STAFFORD, Sacramento-San Joaquin Water
Supervisor

GORDON ZANDER, Adjudication, Water Distribution

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CARLETON PIERSON, Specification Writer

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J. W. DUTTON, General Superintendent Construction

W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

W. M. CALLAHAN, Electrical Engineer

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

FRANK B. DURKEE, General Right of Way Agent

C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample



CALIFORNIA HIGHWAYS and PUBLIC WORKS



*California School for the Blind
and
Berkeley*

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By **A. L. BANKS**, Assistant Deputy Director of Public Works

CALLED from the dispirited ranks of unemployment, 3600 men are now mending, dressing and improving the highways of California. They face the winter in a mien of cheerfulness that was sadly lacking a few weeks ago. Better still, nearly 18,000 dependents have welcomed hope and comfort back to their homes. For, be it known, married men have been given every preference. The more children, the greater the consideration. Out of 40 men taken from Sacramento, every one had at least five children; some had seven and eight.

Governor Rolph's highway maintenance program calling for this extra labor will put about \$52 monthly into the pocket of every man in the big crew. The State Department of Public Works, Highway Division, has increased its daily pay roll by \$7,200 in order to meet this one item. Good old California!

Nor is this all. Every phase of highway and construction work has been speeded up. Literally millions of dollars in new contracts have been let the last few weeks. Authorizations are going out for new highways, for new buildings and for every form of State improvement.

Good Cooperation

But—speaking directly of the emergency work of the Public Works Department—the joy apparent among the department attaches in preparing for it was proof of their fine fibre. And the cooperation received from every part of the State made the work of preparation even easier.

The 3600 men called to the highway work were not taken from cities or communities on a basis of population. The district engineers had worked out their itemized programs. These were adjusted to terms of men and money. Work which ordinarily would not have been taken up until next year, was set up for immediate attention. The men were called by quota from points adjacent to the job in hand. In most instances the program

was so arranged as to enable the men to spend their nights at home—to take back to their families their full day's wage.

Old man machinery is out of luck, for the time being. The program for the next few months gives the right of way to hand labor. And it is a wholly legitimate clearance. Under any circumstance or at any time, the work in hand would have been done by hand power. And none of it is "made jobs."

Not Charity Work

Colonel Garrison has been insistent that the labor fit the going program of the division. He said it must be

carefully planned and as carefully supervised. This means that there is no charity in it. The State and its work-needy citizens are working in a reciprocal relationship.

In assembling the men, 145 mayors and about 90 Legion Posts and rural officials were contacted. A personal letter from the Governor went to each. He invited their cooperation, specifying that the men must be (1) bona fide residents of California, (2) married men or those with sole dependents, and (3) known to be acutely in need of employment.



A. L. BANKS

State Commissions and U. S. Board Get Into Action on Water Problem

INCREASINGLY active and State-wide interest in California's water problem has been evidenced during the past month. Governor Rolph has made several public addresses calling attention to the vital importance of obtaining an economically sound solution of the problem, and of the necessity for doing this with the least possible delay.

Governor Rolph's commission of citizens, known as the California Water Resources Commission, has organized and has held several meetings, two of which were joint meetings with the California Joint Legislative Water Committee. Both bodies are cooperating with each other, and have discussed plans for joint procedure.

The California Joint Legislative Water Committee held a number of public hearings in order that all phases of the problem be given consideration. One of the principal duties of the committee is the preparation of proposed legislation and constitutional amendments. The committee has been earnestly at work on the study of this phase of the problem.

CALLS FOR ACTION

The initial meeting of the commission was held in the office of the Governor in San Francisco, September 17, 1931. In addressing the members upon the duties of the commission, Governor Rolph said:

"The problem that you have before you for solution is the most important and pressing one in California today. * * * Immediate and energetic action is required to correct this unsatisfactory and unnecessary situation. It is no longer a local problem. It is one in which the State itself should take a part. The task that is assigned to you is to evolve a plan of action.

* * * * *

"The duties of your commission as set forth in Senate Concurrent Resolution No. 40 are:

1. To study and report upon the conservation, development and distribution of the water resources of the State, including particularly findings and recommendations as to the economic phases and such proposed legislation, resolutions and constitutional amendments as may be necessary to carry into effect a coordi-

nated plan for the development and distribution of the water resources of the State.

2. To meet with and collaborate with the Joint Legislative Water Resources Committee.
3. To cooperate and confer with the President of the United States and any board, commission, congressional committee or other agency of the United States which may have charge of activities in respect to water conservation, utilization, flood control or navigation.
4. To do any and all things necessary to make a full and complete investigation and report.

"It is my desire that you study and report upon all phases of the problem—engineering, economic, legal, financial and constitutional.

"To the fulfillment of your momentous task I pledge you my whole-hearted and unstinted support."

GOVERNOR AT MEETINGS

The chairman, Matt I. Sullivan, former Chief Justice of the Supreme Court of California presided. Shannon Crandall of Los Angeles was elected vice chairman and State Engineer Edward Hyatt, secretary.

The second meeting of the commission was a joint meeting at the invitation of the Joint Legislative Committee and held in San Francisco on September 28th. On the following day a joint meeting was held at Hotel Oakland, with members of the Honorary Advisory Committees appointed by Governor Rolph to assist the commission present. The Governor attended both meetings, outlined the principal features of the State-wide water problem, and assured the committee and commission of the whole-hearted support of the executive and the State departments.

The Honorary Advisory Committees met after the general meeting in the morning and organized by the selection of chairman, vice chairman and secretary. The former Governors Gillett, Pardee and Richardson were introduced by Governor Rolph and addressed the meeting, assuring those present of their interest in the problem and of their willingness to cooperate and assist in every way.

Both the Joint Legislative Water Committee and the Water Resources Commission were in session on September 30th at San Francisco.

(Continued on page 25)

Waste and Want--Cause and Result



DESTRUCTIVE AND COSTLY waste of California's greatest natural resource. This flood scene of March, 1928, shows a major California stream inundating valuable farm lands through a levee break. The flood peak on this stream was 211,000 cubic feet per second.



THE SAME STREAM in August, 1931. It became totally dry and left 4500 acres of highly improved lands without irrigation water. Storage reservoirs would conserve flood waters for use in areas of dire need and give an added degree of flood protection to local areas.

Marked Decrease in Fire Toll Credited to State Highway Prevention Work

AT A MEETING in San Bernardino on October 10th of the southern counties working with the California Fire Emergency Committee, State Forester M. B. Pratt asserted that the marked decrease in the number of fires this year attributed to carelessness on the part of smokers and campers was mostly due to Department of Public Works and the automobile merchants.

"The splendid press releases from the California Highway Patrol on the number of citations for throwing lighted materials from moving vehicles," said the State forester, "and honorable merits awarded highway patrolmen for putting out fires were educational measures of great value in the fire prevention campaign."

PRESS STORIES HELPED

"The press of the State during the fire season months continually carried news items of the oiling and burning in and along the rights-of-way of the State Highway System by the Division of Highways as a preventive to fire starting and as a fire break for fires starting elsewhere.

FIRST DEFENSE LINE

With over 2000 automobile dealers cautioning patrons against fire, the State Highway System proved itself to be a veritable first line of defense and Colonel Walter E. Garrison, director of Public Works, carried out his part as a member of the California Fire Emergency Committee to the letter with very definite results."

EDUCATIONAL CAMPAIGN

As carelessness in the use of the lighted cigarette and camp fire is mostly attributable to people living in cities and towns, it was announced at the San Bernardino meeting that the California Fire Emergency Committee through the county fire emergency committees would devote the winter months to an educational campaign with the volunteer fire departments of the cities and towns sponsoring the movement.

At a meeting of the Northern California Fireman's Association, a body representing all the towns north of San Francisco and

Sacramento to be held in Arbuckle early in December, a definite fire program will be arranged, aimed directly to reach the city folks using the highways in the forest fire season.

Fire organizations in the southern counties have been active for several years along such a line and forestry officials credit the low fire record maintained in southern California during the fire season just passed to the activity of fire organizations.

CLEANING COUNTY ROADS

With a State appropriation to the Department of Public Works for cleaning debris from the State highways and a Federal appropriation to each national forest for county roads within the national forests, cooperative agencies with the California Fire Emergency Committee are urging a State appropriation for the State forestry department to match county funds provided by law for the removal of debris from county roads outside of national forests.

The fire hazard removal campaign of the Division of Highways for 1931 extended into forty-six counties, covering 1150 miles at an expense of \$80,000. The spraying with oil and burning of roadside vegetation in the spring is followed in the fall and winter by clearing in forest areas. Crews are set to work cutting and burning slash and down timber within the State highway right of way.

During this winter a considerable sum will be expended for this purpose contributing to the relief of the unemployed.

STATES SHOW INCREASE

The mileage of State Highways surfaced during 1930 was 27,464, an increase over the preceding year, and State highway departments expended \$980,000,000 on roads in the year, an increase of 22 per cent over 1929, the bureau of public roads, Department of Agriculture, states.

Total State income for highway purposes during the year was \$1,136,673,437, and only nine states showed a decline in this income, the bureau said. The figures do not include work by counties, townships or other jurisdictions, it is explained.

"Why that net at the railroad crossing?"
"To catch auto parts."

How State Cooperates in Building Highways Through Municipalities

There were included in the present highway budget appropriations totaling \$2,700,000 for the improvement of State highways within the corporate limits of cities. All of these appropriations were set up on a cooperative basis allowing for participation by cities on the basis of agreements made through the State Highway Commission. The State's policy in this matter and details of the procedure for cooperation between State and city are clearly set forth in the following paper read by State Highway Engineer C. H. Purcell before the recent convention of the League of Municipalities at Del Monte.

By C. H. PURCELL, State Highway Engineer

ONE of the functions of a State Highway System is to connect centers of population. The State Highway System of California fulfills this function. The 202 cities of California served or connected by State highways represent 70 per cent of the total State population.

All of these cities are termini for local traffic originating in their immediate vicinity; most of them are the end of the journey for some through traffic. In nearly every case, however, a fairly well defined route through the municipality has been established, or has become such through usage, for traffic proceeding to a further destination. This route might be designated as the route of the State highway through the city.

ADDED THIRTY-SIX MILES

The total length of such routes within corporate limits is about 457 miles. Thirty-six miles of this total were added when the 800 miles of secondary highways were added to the State system this year. This mileage within the cities is about 6 per cent of the total State highway mileage.

Viewed thus, as a total, these figures present quite a different picture than when visioned, as we usually do, as individual units.

The first question which comes to our minds and which, obviously, has occurred to many before: Who has the responsibility of providing the required improvement on these through routes?

In the early days of State highway activity, this responsibility was definitely assigned to the community. But not many years later, when the mileage of improved State roads began to increase, when longer stretches of continuous pavement became more common,



C. H. PURCELL

then the short sections of unpaved or deteriorated pavement through communities which were financially unable to improve their streets, brought this question more forcibly to attention.

Although under authority of existing legislation and the bond acts, some improvement was done by the State within corporate limits of cities, the large mileage of incomplete State highways whose cost exceeded the available

(Continued on page 32)

Good vs. Bad Roads Reflected in Costs Of Operating Autos

PROOF that good roads are a paying investment from the highway user's point of view is shown by an analysis of automobile operation costs on various types of highways according to the American Road Builders' Association.

AVERAGE COST OF 800 CARS

From detailed cost records reported on about 800 automobiles operated in various parts of the United States, figures were prepared taking all factors into consideration, showing the average cost of automobile operation over all types of surfacing to be in cents per mile:

COST PER MILE	
Type of car	Cents
Light fours.....	6.02
Medium fours.....	6.42
Heavy fours.....	7.20
Light sixes.....	7.38
Medium sixes.....	8.40
Heavy sixes.....	9.45

Among the various items of operating cost, road condition is shown to have no effect on license, garage, interest and insurance. The increase in cost of maintenance and in depreciation of automobiles as the type of road becomes poorer is in somewhat the same ratio as the increase in gasoline consumption, shown above. In cost of tires and tubes comes the greatest increase, and it is estimated that where \$1 is expended for this item on improved roads of high type the cost is almost triple on roads without improvement, or \$2.90.

The division of cost items on an imaginary "average" automobile, based on annual mileage of 11,000, is shown as follows:

Item of cost	Cents per mile
Gasoline.....	1.31
Oil.....	0.22
Tires and tubes.....	0.64
Maintenance.....	1.72
Depreciation.....	1.39
License.....	0.14
Garage at \$4 per month.....	0.44
Interest at 6 per cent.....	0.36
Insurance (fire, theft, tornado).....	0.21
Total cents per mile.....	6.43

SAVING PER MILE

The saving shown in operation of such average automobile due to road improvement is, where roads without improvement are changed to intermediate type, 1.07 cents per mile, where intermediate type is changed to high type, 0.99 cents per mile, and where unimproved type is changed to high type, 2.06 cents per mile.

The cost tables range from 11 cents per mile, the cost of operation of a "heavy six" over unimproved roads, down to 5.10 cents, the cost of operating a "light four" over high type roads. This gives a conservative figure for the lightest car and the best road conditions obtainable, and for the heaviest car operating on unimproved roads.

No man's opinion is entirely worthless. Even a watch that won't run is right twice a day.

Miss Murray Swings Wicked Hoe, They Say, Up in Sutter County

THE visitor who comes to the executive offices of the Department of Public Works in Sacramento is greeted by a tall, comely, silver-haired woman with a smile. And what a smile!

It warms the cockles of your heart and makes you feel right at home, because sparkling eyes behind the big glasses through which she beams upon you radio an inaudible "Cheerio, my friend, glad to see you."

Miss Myrtle V. Murray is the dispenser of the exotic smile and as a valued member of the State government she has been greeting visitors in the same cordial way for twenty years.

Entering the State's employ as a girl she has seen a long procession of governors and directors come and go—five governors and six directors to be exact.

GOT EARLY START

In 1911 she started as a stenographer in the Highways Department, as it was then named. The staff consisted of the chief, an assistant and two stenographers. Then she went into Governor Johnson's office serving under him and Governor Stephens for eight years returning in 1921 to the newly organized Department of Public Works and became its highly efficient secretary.

In addition to her multifarious duties in that capacity, she is the boss and mother confessor of seven girl stenographers and that's some job in itself. But every girl who ever worked for her loves her, they declare, so that's the kind of a boss Miss Murray is.

KEEPS ALL SECRETS

And she can keep secrets of State just as well as she keeps the girl's secrets. Ask the reporters, they know.

If some week-end you are motoring through Sutter County and passing a large peach and prune ranch observe a tall, lithe woman busily hacking away at the orchard weeds—that's Miss Murray. She and her two sisters own forty-seven acres of bearing peach and prune trees and her one great diversion is to hie away from affairs of State on Saturday afternoons to play the role of the lady with the hoe among her beloved fruit trees.

You wouldn't believe it to look at her but they say she swings one of the wickedest hoes in all Sutter County.

GOVERNORS



SHE'S SEEN THEM
ALL COME AND
GO SINCE 1911



SECRETS



HER HEAD IS
FULL OF SECRETS
OF STATE



THERE ARE SMILES that make you happy and here's the real thing, exclusively produced and dispensed by Miss Myrtle V. Murray, secretary of the Department of Public Works. For twenty years she has been welcoming visitors to the executive offices of the department at Sacramento with this cheery smile. Her head just buzzes with secrets of State but she's a veritable genius at guarding them. She's the boss of seven girl stenographers, all of whom love her. And her hobby? You'd never guess it. Nothing less than ranching. She spends nearly every week-end swinging a mean hoe and spade on her fruit ranch.



SHE'S A RANCHER
SATURDAY AFTERNOONS
SUNDAYS AND
HOLIDAYS



GOOD MORNING
MISS MURRAY

SHE'S LOVED BY
ALL SHE BOSSES

Nation's Highway Builders in Annual Session Back Employment Measures

The American Association of State Highway Officials is a distinguished organization composed of experienced authorities on highway construction and policies from all the states who gather in convention once a year to discuss such problems. Their conclusions are accepted as the voice of highway officialdom in all State, Federal and Congressional circles. The following report of the recent meeting at Salt Lake is made by one of the California delegation:

By C. C. CARLETON, Chief, Division of Contracts and Rights of Way

THE SEVENTEENTH annual meeting of the American Association of State Highway Officials was held in Salt Lake City, Utah, beginning Monday, September 28th, and closing on Thursday, October 1, 1931.

The California Highway Department was represented by Earl Lee Kelly, chairman, and Harry A. Hopkins, commissioner, of the California Highway Commission; C. H. Purcell, State Highway Engineer; T. E. Stanton, Materials and Research Engineer; Fred J. Grumm, Engineer of Surveys and Plans, and the writer.

While the numerous problems affecting State highway finance, construction, maintenance, protection and beautification were duly considered in general and section meetings, the dominant note of the convention was the aiding of employment throughout the country.

Mr. W. C. Markham, executive secretary of the American Association of State Highway Officials, echoed this note when he said in his address: "We have always been taught to measure road improvements by the yard. This year we are asked to reckon them by heart beats."

The opening address of the convention was made by Henry H. Blood, chairman, State Highway Commission of Utah, and retiring president of the American Association of

State Highway Officials. He urged that the present regular appropriations for Federal aid roads, forest roads and highways across the public domain be continued by Congress.

He urged also that the Federal government make as much money available as possible for emergency work. He asked that the new

emergency money be considered a direct appropriation to the states rather than a loan, as was the 1931 emergency appropriation, and declared that the efficiency with which the 1931 emergency appropriation of \$80,000,000 was spent justified more such funds.

He asked that the Federal government consider the advisability of making a portion of the Federal funds available for force account work, to give the highway departments a little more leeway in providing some emergency

projects in special instances.

He stated, however, that the contracting system should be maintained for the larger part of the work.

He suggested also that steps be taken to provide as much hand labor as is consistent with good economies, but warned that the highway departments and the Federal government should remember also that there is labor concerned in making road building machinery.

Mr. W. C. Markham, the executive secretary of the association, incorporated in his



Hopkins, Carleton and Grumm at Salt Lake

UNDER GOOD CONTROL is the portion of the Shellville Highway between Napa and Shellville where "Check" Meyer operates his Division of Highways courtesy car piloting traffic over the one-way strip beside new surfacing.

In the good old days when a road had to be repaired or reconstructed it was customary to fence it off with a big detour sign and let the motorist shift for himself. Sometimes an alternate rough road was provided for him through trees and fields.

The modern method of the California Public Works Department is different. It is founded on the policy of extending every courtesy to the motoring public. If possible only half of the road is closed at one time. When this policy was first put into effect motorists in trying to pass each other on the narrow strip would occasionally get off on the soft, unfinished portion. Hence the control car.



"CHECK" MEYER and His Control Car

Menace of Drunken Driver Increasing on State Highways

THE INCREASING menace of the drunken driver on the highways of this State is convincingly shown in the latest official report that 1481 motor accidents involving death or injury were caused by drunken drivers or drunken pedestrians during the first seven months of this year.

Of these accidents, 133 resulted in deaths. The other 1348 ranged from serious accidents that left their victims crippled for life, to those of a minor nature.

Of the drivers involved 1293 were listed as having been intoxicated. There were 188 drunken pedestrians involved.

Physicall defects either in drivers or pedestrians resulted in eight deaths and injuries to sixty-four individuals during the period.

The observation has been made by patrol officials that in traffic accidents involving a drunken pedestrian the pedestrian himself is usually the victim. Where intoxicated drivers are directing the motor vehicle an innocent person is frequently killed, while the drunken driver may escape injury entirely.

The number of drunken drivers is steadily increasing each month, according to the State records.

Good Roads Values Can't Be Expressed in Terms of Money

THE VALUE of good roads can not be expressed in money. Like all other good things, hard surfaced roads have immense collateral values. Collateral advantages and intangible values spring up around every useful enterprise. To this rule there are no exceptions, and good roads form a particularly happy illustration of its truth.

"Good roads answer the need of humanity for one of the three essentials of organized society—food, shelter and transportation, and roads serve all three. Good roads are lines of easy transportation and communication. They relieve the tedium and isolation of the country, and offer the blessings of rural life to the city worker. They form lines for the development of community interest. They foster and create community development; bring educational and recreational values to dwellers in the city and country alike; develop national and State patriotism."—Arthur M. Hyde, Secretary, U. S. Dept. of Agriculture.

BUILDING INCREASES

According to reports received by the Bureau of Labor Statistics of the United States Department of Labor from 338 identical cities having a population of 25,000 or over there was an increase of 13.4 per cent in the estimated cost of buildings for which permits were issued during the month of August, 1931, as compared with the preceding month.

On July 1, 1931, a total of 1,476,000 automobiles and motorcycles were registered in Germany. Of this number, 522,943 were passenger cars, 161,072 trucks, and 792,075 motorcycles.

Progress of Governor's \$5,000,000 Construction Program for 1931

By **W. K. DANIELS**, Deputy Chief, Division of Architecture

ONE OF the paramount public problems of the day being relief for the unemployed, it is quite appropriate at this time to make a brief analysis of what effort and accomplishment the Division of Architecture can show for its small part in unemployed relief by its operation of building construction, a business that employs nearly one hundred different crafts.

Building construction therefore being a major remedy for unemployment, Governor James Rolph, Jr., immediately after taking office on January 5, 1931, sponsored the legislation creating appropriations amounting to \$5,109,600 for State building construction. The several acts of Legislature making the appropriations were declared urgency measures and thereby made the moneys available immediately upon the signed approval of the Governor on January 16, 1931.

By the end of February, or approximately forty-three days later, the Division had a total of twelve projects ready for the taking of bids representing a construction valuation of \$826,200.

By the end of April the Division had an additional total of eighteen projects ready for the taking of bids, representing a construction valuation of \$782,625, making a total of thirty projects having a construction valuation of \$1,608,825 placed on the market of bidding within three and one-half months after funds were available.

Got Prompt Action

This would indicate the action taken by the Division in getting started promptly on the Governor's urgency building construction program.

By the end of August several of the projects had been completed ready for occupancy. Outstanding among these were the Poultry Building and the Live Stock Building constructed at Agricultural Park, Sacramento.

These buildings were not only ready for the poultry, sheep and swine one week before fair time, but had shrubs planted and grass growing around them also.

By the end of this year, 1931, practically all of the Governor's urgency building construction program will have been placed in the field of the building trades with the exception of the appropriation for the new State Hospital in southern California. This project must await a final selection of a proper site, and every effort is being made at this date to accomplish this important undertaking.



W. K. Daniels

One Hundred Going Projects

However, the Governor's so-called five million dollar building construction program was not all the Division had to offer in the way of construction work to relieve unemployment. Many building projects financed by former legislation had just started prior to the first of 1931 and several had not been started, so taken together with the new appropriations they created a very large amount of work under way in the construction field by July 1, 1931, a total approximately of one hundred projects representing a construction valuation of \$5,843,000.

By the first of the coming year the Division will have placed in the field of construction an additional amount of construction work of over \$4,000,000.

It is therefore a fact and an assurance that hundreds of mechanics have been and will be put to work during this year and part of next by the efforts of the State administration along its one line of many endeavors, that of building construction.

This accomplishment is even more apparent when consideration is given to a change of administration and reorganization which created new department heads, new procedures and new policies, which fact made the securing of necessary approvals of procedure a harder problem.

(Continued on page 15)



LOTS OF WORK for men of many crafts and trades is represented by these handsome structures, all of which have been put under construction since January 1 by the State Division of Architecture as part of Governor Rolph's \$5,000,000 building plan for 1931. Some have already been finished and all will be by the end of the year. No. 1 is a ward building of the Agnews State Hospital, under construction. No. 2 is the Poultry Building at Agricultural Park, Sacramento, finished. No. 3 is an annex to the State Office Building, Sacramento, under construction. No. 4 is a ward building of Mendocino State Hospital, under construction. No. 5 is a cottage for boys built and finished at Whittier State School. No. 6 is the new National Guard Armory in course of erection at Yuba City.

Consultants Approve Transbay Bridge Plans; Predict Saving Several Millions

By CHARLES E. ANDREW, Bridge Engineer of San Francisco-Oakland Bridge

VERY satisfactory progress is being made on the design work for the San Francisco-Oakland Bay Bridge.

Immediately after funds became available for this work, on August 15th an office was opened at 500 Sansome Street in San Francisco, and the formation of a design organization was started. Excellent office quarters were obtainable at very reasonable cost. Room is provided for a force of about 50 designers and draftsmen, with ample office space for executives and consulting board members.

The wide publicity given to this project has attracted many engineers and, as a consequence, a very large number of applications have been received from men of exceptional ability. Engineers in charge of the work have found it to be a major task to assemble these applications and select the men most fitted for the work in hand. Only those men having experience in structural design, particularly bridge work, can be used.

LOCAL MEN HIRED

Local engineers are being employed as far as possible, with the result to date that out of 33 employees only 4 are from without California, and practically all of the remaining 29 are from the bay cities.

The designing forces will be gradually recruited to a personnel of about 50 or 55 employees, and no trouble will be encountered in obtaining these additional men required locally. It is the intention of those in charge to adhere to the principle of employing only local engineers for additional positions available.

Work is progressing very rapidly on the studies of final layout for the structure. The Consulting Board, consisting of Mr. Modjeski, Moran & Proctor, Mr. Moisseiff, Professor Derleth, Jr., and Mr. Brunnier, have held their first meeting in consultation with the Chief Engineer, Mr. Purcell, Bridge Engineer Andrew, and Engineer of Design, Mr. Glenn B. Woodruff.

GENERAL PLAN APPROVED

The Consulting Board have approved the general cross-sections of the bridge and required traffic capacity, i.e., a double deck structure with 6 lanes of auto traffic on the upper deck and three lanes for auto trucks and two electric inter-urban tracks on the lower deck.

They also have approved the general lay-

out of span types as originally proposed, which contemplates the use of a suspension structure between San Francisco and Yerba Buena Island, and a cantilever structure and

TO INSPECT MODELS

GOVERNOR JAMES ROLPH, JR., on Wednesday, November 4, will visit the University of California to inspect the experimental models for the San Francisco-Oakland Bay bridge. He will be accompanied by the mayors of Berkeley, Alameda and San Francisco and his Bridge Authority composed of Lieutenant Governor Merriam, Director of Finance Vandegrift, Director of Public Works Garrison and Chairman Kelly of the California Highway Commission. The official party will also include the Transbay Bridge Citizens Committee headed by E. B. De Golia.

The bridge models have been constructed by Professor George E. Beggs of Princeton University in collaboration with University of California scientists and engineers of the California Department of Public Works under Charles H. Purcell, State Highway Engineer, and Charles E. Andrew, Department Bridge Engineer.



Photo courtesy San Francisco Call-Bulletin

YES, IT'S BRIDGE they're studying, but not the card game. These studious gentlemen comprise the Consulting Engineering Board called together by State Engineer Charles H. Purcell to discuss the controlling factors in the design of the San Francisco-Oakland Bay Bridge. The board is composed of the following men, all eminent in their profession: Standing, from left to right, are Leon Moisseiff, Consulting Structural Engineer; State Engineer Purcell; Charles E. Andrew, State Bridge Engineer, and Daniel E. Moran of Moran and Proctor, Foundation Consultants of New York City. Seated at the table, from left to right, are H. J. Brunnier, Consulting Engineer; Ralph Modjeska of New York City, Chairman of the Board, and C. Derleth, Jr., Dean of Engineering, University of California.

fixed spans between the Island and the mainland at Oakland.

Mr. Modjeska, Chairman of the Board of Consulting Engineers, has expressed the opinion that the cost of the bridge will be well within the original estimate made by the department, i. e., \$75,000,000. He believes that the final figure will be several millions less, and may run as low as \$65,000,000 to \$70,000,000.

This opinion from an engineer of world-wide prominence and long experience in the design and construction of the world's largest bridges is very gratifying to the engineers connected with the project, as well as the general public.

Wonderful cooperation is being given to the engineers in charge by the various government and civic bodies. Many important prob-

lems remain to be solved, and the State administration is doing everything in its power to expedite the work and make this great project a reality at the earliest possible moment.

There seem to be no insurmountable difficulties which can not be solved, and the engineers in charge feel certain that by 1937, or probably 1936, the bridge will be open to transbay traffic.

SEEK ACCIDENT CURE

An increase of 26 per cent in motor vehicle accidents for the first six months of this year, compared with a similar period last year, has stimulated the California Committee on Public Safety to seek the cooperation of the State Judicial Council to bring about a more even and rigid imposition of penalties in the courts for traffic violators as a means of promoting public safety. This course was decided upon at the meeting of the executive committee held in San Francisco.

New Cut-off Highway Route to End Dangers of San Juan Bottle Neck

By L. H. GIBSON, District Engineer

AS OUR California travelers have been growing more accustomed to the higher standards of highway construction, the old San Juan grade crossing the Gabilan Range on the Coast route, between Salinas and San Juan Bautista, has been becoming increasingly exasperating to motorists traveling between Los Angeles and San Francisco.

The old San Juan grade was constructed in 1915, and at that time was entirely adequate for the prevailing traffic. Due to the tremendous increase in motor vehicular travel, this grade has been obsolete for several years. Because of the long grades, narrow roadway and sharp curves, it is now a bottle neck on the Coast Highway and the scene of many unfortunate accidents.

Different Location

The elimination of the bottle neck is now being accomplished by construction of a new highway, 16.6 miles long, on an entirely different route. Of this distance, 11.1 miles is well along towards completion, and the contract for the remaining 5.5 miles has been awarded to the Peninsula Paving Company, builders of the first section. Construction of a new bridge across the San Benito River is part of the project.

This new highway route lies partly in Monterey County and partly in San Benito County. The general location is on the coast route (U. S. Route 101), about 100 miles south of San Francisco. The southerly end is two miles north of Salinas and it passes through the villages of Santa Rita, Prunedale and Dumbarton. Its northerly terminus is at its junction with the existing State highway three miles north of the mission town of San Juan Bautista.

Much Lower Elevation

Instead of crossing the Gabilan range of mountains, this cut-off passes over mesas and through a series of valleys in the foothills of that range. There is a saving in distance of 1.2 miles. The highest elevation reached is 550 feet, whereas the pass on the present San Juan grade route is at an elevation of 1050 feet.

Contrasted with the present route over the mountains, where frequent sharp curves allow

only a sight distance of 75 feet, the new highway with its long radius curvature and low gradient will permit motorists to travel at all points at the highest speed permitted by the California laws. The old grade will remain as part of the State highway system.

The new highway construction project follows partly along the route of the old "Camino Real" between Monterey and San Benito counties. It passes through a narrow gorge known as the "Pinecate Rocks" in San Benito County, romantically interesting because in the bandit days of California it was the scene of many stage holdups. Foot-holes in a prominent rock are still evident where bandits scaled it to hold up stages from a point of vantage. Twelve acres additional right of way was obtained at "The Rocks" to preserve for all times the beauties of this romantic spot.

Through Scenic Country

Much of the route is scenically beautiful—of a pastoral character—different than any other section along the coast route, consisting of small fruit and chicken ranches. On the mesas gnayule (Mexican rubber plant) and grain are extensively grown.

The new route will be particularly appreciated by truck owners, as to a large extent the old grade has prevented the use of trailers, and because of its grades has greatly increased the cost of truck travel.

The new route is so located that connecting highways will undoubtedly be constructed which will bring the San Francisco Bay district much closer to several cities of Monterey County. By the construction of a highway between four and five miles long between the new road and Castroville, several miles in distance and much time will be saved to travelers between San Francisco and the Monterey Peninsula.

Cut-off to Connect

Monterey County is already building an improved highway connecting the new route with Watsonville, and Watsonville will then be brought within nine miles of the coast highway. This latter cut-off will make possible a pleasurable circle tour starting at San Francisco, Oakland or San Jose, and passing along



TOUGH GOING was encountered by the contractor on this portion of the San Juan grade realignment out of Salinas where the route lay through a mountain swamp. In the above picture is shown machinery working in a heavily watered peat bog. Seemed impossible to ever put a road there, but the bog was scooped out, filled, and today is part of the fine new highway cut-off to be opened early next summer.

the coast from Santa Cruz to Watsonville, and returning via Gilroy and Morgan Hill.

Highest Standard Road

The new highway being constructed to eliminate the San Juan grade is of the highest standard in design. It consists of a graded width of 40 feet in cuts and 38 feet on fills. The Portland cement concrete pavement, 20 feet wide, is being laid in two 10-foot strips. Expansion joints are placed every 60 feet with weakened plane joints at 20-foot intervals. It is reinforced throughout against corner breaking and edge cracking. The 10-foot strips are 7 inches thick in the center and 9 inches at the edges.

Where the roadbed conditions are more unstable, the pavement is thickened to 9 inches in the center and 11 inches at the edges. Several wooden bridges with concrete decks are included in the drainage structures. Smaller drainage structures consist principally of concrete boxes and corrugated iron pipes. The cost of the project completed will be nearly \$1,000,000 and the new road will be opened early next summer.

Building Studies Cover Wide Field

(Continued from page 10)

The passing of the new Wage Scale Act also added a tremendous amount of office work involving labor studies and the securing of proper data and information to establish prevailing minimum wage scales for State projects. The wide field of operations was scattered from Mt. Shasta to San Diego, and all handled out of the Sacramento office. Also a great amount of time was necessarily given to reports, acting in an advisory capacity, surveys, studies and investigations of proposed sites of possible future activities which can not be listed in the construction valuation amounts given.

Nor is this accomplishment the work of any single individual, but the united effort of the organization personnel having a desire to be up and doing at all times. It is a happy privilege to be a small working part in the important machinery of State building construction.

Workers Called From All Over the State

(Continued from page 1)

They were asked to send their quota lists to Colonel Garrison. The response was gratifying. Also it disclosed in sombre reality the extent of unemployment. In one city where 40 men were called for, the mayor replied that he had 2200 worthy citizens on his waiting lists.

Soon on Job

As fast as the lists were received Colonel Garrison caused them to be copied, checked and certified to the district engineers. The district engineers were provided with cards with which to carry Colonel Garrison's notification to the men. In some instances the remoteness of the homes of the men occasioned a few days' delay; but the major part of the force was in motion by the fifteenth instant.

It is doubtful whether there was ever such a widespread and unique assembling of men. Here we read "Crescent City." Then, over the valley and Sierras to Alturas. Take your map and look up Garberville, Pepperwood and Smith River. They are all on the list. Susanville, Dunsuir, Auburn, Colusa and Marysville! Evidently we are moving south and taking in all the little places between. From Grass Valley over to Gilroy is some jump; but keep at it and take a look at the quotas of Santa Cruz, Livermore, Napa and Redwood City.

From Desert and Valley

We are too far down now to mention Quincy and Portola, San Juan, Paso Robles, King City and larger-sized towns down the south coast line. Getting over into the big valley, look up Delano, Maricopa, Lemoore, Goshen and Taft. They are all there, and with Fresno, Modesto, Merced and like larger cities. Who knows where are Grape Vine, Pixley, Oildale, Bodfish and a score of other little towns with which the engineers are familiar.

For jobs on the desert, San Bernardino heads the whole list with 150 men, due to the fact that some big work is under way in the direction of Arizona. But Brawley, Corona, Needles, Blythe and a dozen other sun-kissed towns are in with quotas. Then there's Saugus, Fallbrook, Palmdale and Lancaster. Bishop comes in strong. San Diego towns appear. Victorville and Coachella have nothing on Bear Valley.

In District No. 10 the call is all the way from Fairfield to Angel's Camp, from Oakdale to Sutter Creek.

Jobs Close to Home

For a post-graduate course in California geography, just study the quota lists worked out by the engineers for the Governor's call. And every quota of men is sent directly to a job that is relatively close to their homes.

The drawing of men from these interior points will also go far to avert further congestion of the unemployed in the more populous centers. It leaves them free to work out their local problems and puts them in a position to benefit more largely by such future measures as may be taken for the alleviation of unemployment.

The Governor, Director and Highway Commissioners are well aware that this program is but one helpful move in meeting the serious problem. The pressure for employment is great and widespread. It is

not possible to always make favorable response, even to applications that are pathetically appealing. The \$1,500,000 made available by the Commission for this particular undertaking fixes the limit to which the employing power can go.

The dollars must be divided by men and the limit is apparent.

Hopeful Signs

But there is a hopeful sign observable in the tone of letters from local officials. They seem to have caught the spirit of the Governor's move and are working on plans of their own along the same lines.

Supplementing the special program, the maintenance engineers have brought their regular working forces up to the maximum allowed by their budgets.

The 3600 men set to work are in addition to the 20,000 already engaged in the constructive service of the State. In his letters to the mayors, the Governor mentions 3800 men as the number to be called into action; and they will be as fast as the quotas are cleared to the engineers.

The responses of the Mayors are in fine spirit, and the promptness with which they sent in their lists materially assisted in launching the work on time.

AMENDED VERSION

Show me a paved road home,
I'm tired and I want to go to bed.
I just drove to town 'bout an hour ago,
In mud clear up to my head.

Wherever I chance to roam
Through sand and mud and loam,
You'll always hear me singing this song,
Build me a paved road home.

THIS DRIVER PLAYS SAFE

Hats are off in the automobile world to George Marketak, a truck driver of Chicago, who has just rounded out 250,000 miles of travel without so much as scratching the fender of his own or any other motor vehicle. His driving rules are: "Never try to beat the traffic. Steady driving will get you farther and faster than spurts. Always expect the other fellow to do the wrong thing. Allow ample room between your own car and that ahead of you. Never drive so fast that you can not stop in the distance you can see ahead. Even when you have the right of way, don't take too much for granted."

Census Taker: "Would you mind telling me if there is any insanity in your family, lady?"

Young Resident Engineer's Wife: "Well, no, not exactly. Only my husband thinks he's boss here at home."

Betty was taking her first ocean voyage, and for the first three days the sea was smooth as glass. On the fourth day out a squall came up and the good ship bounded around like a broncho.

"Mother," finally asked Betty, "what's the matter? Are we on a detour?"

Governor's Letter to the Mayors

Here is the letter expressing the spirit of California sent by Governor Rolph to the mayors throughout the State asking them to cooperate in his program for unemployment relief by sending names of married men out of jobs to the Department of Public Works according to the quotas allotted to their cities.

My Dear Mayor:

As Governor of California, I am deeply concerned over the present unemployment situation and particularly with the need of vigorous relief of our fellow citizens during the coming winter.

California should lead the way and stand out as one State in the Union willing to care for those citizens thrown out of honest employment by the present business depression.

At my request, the Department of Public Works has prepared a program of work for approximately 3800 men to be employed over a period of five months starting October 15th. Each man is to be given three days' work per week in or near the community in which he resides.

The funds available necessarily are limited and the employment planned, all hand work, will be upon maintenance work which otherwise would not have been reached for at least a year.

May I not count on you, as elected representative of the people of your community, to help make this program a success by personally selecting the men who require work, or by appointing a committee to perform that function? From your city ----- men will be employed.

To insure the greatest benefit, both to the State and your city, those employed must be able-bodied men, heads of families, who are citizens of the United States and who have been residents of California for at least one year.

I would appreciate it if you would communicate your acceptance to Walter E. Garrison, Director of Public Works; also enclose names and addresses of the men to be employed.

Thanking you for your interest in this matter, and assuring you of my continued interest in your city's welfare, I am

Very sincerely yours,

(Signed) JAMES ROLPH, JR.,
Governor.

Dangerous Hours for the Children

The most dangerous hours for children in the streets are from approximately 4 o'clock in the afternoon until 7 o'clock in the evening, according to an announcement by the National Safety Council.

Investigation shows that the kiddies straggle home from school, stopping every now and then for a game of tag or leapfrog, and if there is no better place available, they are quite likely to use the street for a playground. Traffic also becomes heavier late in the afternoon, and in winter early darkness comes.

Poor visibility at dusk, numerous cars in the street, and youngsters lingering after school hours, all contribute toward making the late afternoon a perilous time for kiddies in traffic.

Chosen to Preserve Beauty of Roadsides

The committee of the Western Association of State Highway Officials which will undertake a study of the conservation of roadside beauty and the securing of adequate rights of way for highways across public lands has been announced as follows:

Frank B. Durkee, General Right of Way Agent in the California Department of Public Works, Sacramento, chairman;

Roy Klein, State Highway Engineer of Oregon, Salem;

T. S. O'Connell, State Highway Engineer of Arizona, Phoenix.

The committee was authorized by a resolution adopted at the annual meeting held in San Francisco on July 10th and 11th. The appointments were made by Z. E. Seveison, State Highway Engineer of Wyoming and president of the Western Association of State Highway Officials.

Roberts: Has your car a good cooling system?

Woods: I should say so! You ought to see it knock the pedestrians cold!

Progress of Highway Projects on Coast Route Summarized

THE COAST HIGHWAY between Los Alamos and Wismore has been reconstructed for 3.7 miles with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Basich Brothers Construction Company was the contractor.

The portion of the coast highway between Gaviota and one mile north of Las Cruces, 2.8 miles in length, has been reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. Gist & Bell were the contractors. Within the limits of this project there is being constructed a new reinforced concrete bridge across Gaviota Creek in the narrow portion of the canyon. Paul M. White is the contractor under the supervision of the Bridge Department.

38 Miles Surfaced

On the Cuyama lateral, between the second crossing of the Cuyama River and the Kern County line, a distance of 38 miles, the road has been surfaced with crusher run base and oiled rock surface 18 feet and 20 feet in width. The Lang Transportation Company was the contractor.

On the coast highway, between Wigmore and Zaca, the earth shoulders have been treated with fuel oil by the road mix method. The contractor was the Santa Maria Construction Company.

On the coast highway, between Zaca and Gaviota Pass, the shoulders have been treated with fuel oil by the road mix method. The contractor was the Santa Maria Construction Company.

On the coast highway, between Gaviota Canyon and Tecolote Creek, oiled rock borders are being constructed on each side of the pavement. Gist & Bell are the contractors.

San Luis Obispo County—On the coast highway, between Atascadero and one-half mile south of Santa Margarita, 9.8 miles of road is being reconstructed with a 36-foot roadbed and a 20-foot second-story asphaltic concrete pavement. The contractor is the Hanrahan Company.

Bids are being received for the reconstruction of 5.8 miles of the coast highway between Arroyo Grande and Los Berros Creek with a 36-foot roadbed and a 20-foot reinforced Portland cement concrete pavement. This project will substitute for a very objectionable right-angle turn, a curve of 1800-foot radius, in Arroyo Grande and correct unsatisfactory alignment at other places. This will require new bridges across Arroyo Grande Creek and Berros Creek.

On the coast highway north of Paso Robles, a reinforced concrete bridge across San Marcos Creek is nearing completion. L. C. Clark and C. E. Doughty are the contractors.

At various places sunken concrete pavement is being raised by forcing cement and earth grout through openings drilled in the pavement. A special heavy pump is used for this and the work is apparently very satisfactory.

GIVE HIM A TICKET

"Don't you know your way around this town?" asked the sardonic traffic cop.

"No," answered Mr. Chuggins, "if I knew any way around it, you don't suppose I'd have gotten mixed up in it, do you?"—*Washington Star*.

In Memoriam

NORMAN S. HAMILTON of the engineering staff of District 5, Division of Highways was almost instantly killed September 14th by a heavily laden truck. His loss is deeply felt by his co-workers and friends in District 5 where he was admired for his many sterling qualities.

The deceased was born in 1896 in Westly, California, and after finishing the grades and high school work, completed his education at the University of California in 1921. After graduation, he worked for Butte County Highway Department, before coming into the State's service as draftsman in the District V office in December, 1928. He continued in that capacity until April, 1929, when he was assigned to field work, principally as inspector on various paving jobs in that district, and it was while so employed on the paving project between Santa Margarita and Atascadero, that he met his untimely death.

Mr. Hamilton is survived by his wife, Beatrice Levy Hamilton, and parents, Mr. and Mrs. Charles O. Hamilton of Oroville, to whom the heartfelt sympathy of his co-workers is extended in this time of bereavement.

MISS NELLIE DIAMANT, who had been employed in the District VII office of the Division of Highways since 1912, and who had been cashier for that district for a number of years, died suddenly of pneumonia on October 3d at the Hollywood Hospital.

Miss Diamant's death is sincerely regretted by the many friends she made during her long period of very faithful and efficient service with the California Highway Commission and the State Division of Highways.

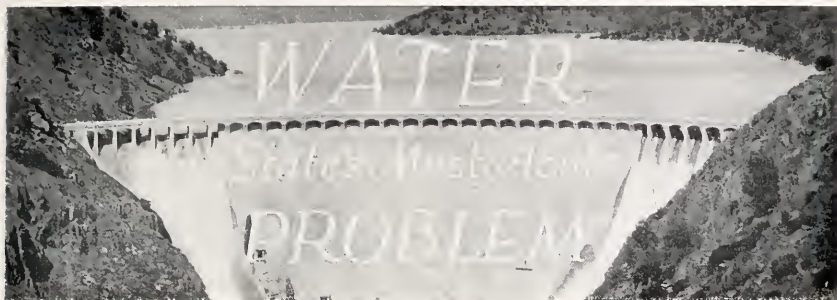
As a mark of respect and esteem and to permit her many friends to attend the funeral services, the district office was closed from 10 a.m. to noon on Tuesday, October 6th.

DON'T BLAME TRUCKS

Automobile drivers who blame bus, truck, and taxicab drivers for accidents resulting from driving have another guess coming, according to an investigation of the increase in fatal highway accidents conducted by the manager of the educational department of the National Automobile Chamber of Commerce. These records show that taxicab operators last year reduced their 1929 accident record by 25 per cent, bus drivers reduced theirs by 19 per cent, and truck drivers by 14 per cent. This achievement is contrasted with the record of private motorists who last year increased theirs by 37 per cent.

SANTA CRUZ INCREASE

During the first six months of this year registration of motor vehicles in Santa Cruz County brought the total car ownership for that area to 15,631. There were 14,220 passenger automobiles registered up to June 30, last. The remainder of registered vehicles consisted of trucks, trailers, and motorcycles, according to the California State Automobile Association.



This is the third of a series of articles on the State's water problem published in California Highways and Public Works. The first dealt with the Governor's call to the entire citizenry of the State to unite in efforts to solve the problem. The second described the Sacramento Valley and Sacramento-San Joaquin Delta situation. This article deals with the complications confronting southern California. Other analyses will follow.

THE problem of a complete water supply in Southern California can be met only by importing water from other entirely outside sources. In this, the problem is the same as that which exists in southern San Joaquin Valley but in detail the problem is different and is vastly complicated. On the other hand since so large a portion of the wealth of the State exists in southern California, the matter of financing is not so difficult as that which attends an attempt to bring water to San Joaquin Valley.

The people of southern California while they would like financial assistance, feel competent to cope with the situation on their own resources and do what is necessary and economical to insure a water supply. The favorable vote on the recent bond issue of \$220,000,000 for Metropolitan Water District exemplifies this attitude.

The term "southern California" generally brings to mind Los Angeles but it should bring a picture of the desert in the eastern part of the State and as well the entire coastal area, two areas widely divergent in climate and conditions. Again, the coastal area separates into three well defined divisions each with its particular problem.

TWO DISTINCT AREAS

For discussion of water supply matters southern California is generally thought of as bounded on the north by the Tehachapi Mountains and by the north line of Ventura County. Santa Barbara County while gen-

erally considered in southern California presents a unique and separate problem and in this paper is not considered as it properly is one of the south central coast basins which have specific problems as to water supply.

The desert country divides into two distinct areas. To the north is Mohave Desert and to the south the Colorado Desert. The latter has two separate areas again in which the problem is essentially the same. The climate is the same and the only possible water supply the Colorado River.

The Mohave Desert is distinguished from the Colorado Desert by having slightly more rainfall and a more temperate climate. The local water supply for the entire Mohave Desert is thought to aggregate around 200,000 acre-feet which includes all the streams running off from the north of the San Gabriel and San Bernardino ranges. Even if this could be all utilized it is far from sufficient for the irrigable land and the cost of bringing water to this area is so great that no feasible plan has yet been conceived.

The Palo Verde Valley and Chuckwalla Mesa which two adjacent areas make up one of the major irrigable areas in the Colorado River Desert, comprise approximately 300,000 acres of land. A part of this is now irrigated and the water supply is sufficient for it all, but cost of extending irrigation to the higher lands has so far militated against their development.

The other large area is made up of the almost adjacent Imperial and Coachella

Reclamation of Sewage Promises Success

(Continued from preceding page)

valleys which lie in the great sink of Colorado Basin, all below sea level. The gross area susceptible of irrigation is 1,000,000 acres of which close to 500,000 acres are now irrigated. **It was the danger of flood overflows from the Colorado River to Imperial Valley which was one factor in causing the construction of Hoover Dam on Colorado River.**

Other items contributing to this were the vexations and difficulties encountered by the present Imperial Irrigation District in taking water from the Colorado River, carrying it through the Republic of Mexico and back into the United States. The Boulder Dam Act embodies a provision for construction of an All-American Canal which would cover the million acres in the two valleys without going into Mexico and at the present time the representatives of the Government and of the two valleys are meeting to formulate a contract for utilization of Colorado River water as controlled by Boulder Dam. If this contract is finally negotiated, construction of the canal will begin when Congress appropriates the money for it.

VENTURA SUPPLY LARGER

In the coastal area Ventura County separates naturally from the area to the south and relatively has a larger supply compared to the habitable and irrigable land than the coastal areas to the south. Next, south and east, there is what is termed South Coastal Basin which takes in the coastal areas of Los Angeles, San Bernardino, Orange and Riverside counties, the total a comparatively compact area in which the irrigated land is contained in a length of 90 miles at its greatest, and a width of 50 miles at its greatest. South of that lies San Diego County with the smallest water supply compared to the irrigable and habitable areas of any of the three coastal areas just mentioned.

The total irrigable and habitable area in the coastal area from Ventura County on the north to the international boundary on the south, is estimated to be 2,000,000 acres which will require 3,000,000 acre-feet of water if present practices in use are continued. The local feasible supplies aggregate 1,200,000 acre-feet which means that if the entire area is irrigated 1,800,000 acre-feet must be brought in from outside.

This amount might, however, be reduced by utilization of sewage which now goes to waste into the ocean. The matter of purification for use in irrigation or even for domestic use is now under experiment and promises to be successful. The cost of such reclamation together with distribution of the water from the outfall sewers at which points it is available, is probably as high per acre-foot as importation of water from outside.

RECLAMATION FEASIBLE

Ventura County requires only a small amount of importation to supply its full needs although if, as

seems possible, importation is cheaper than conservation of an extremely large percentage of its local supplies, water will be imported if it can be obtained, in preference to reclaiming the full local supply. In San Diego County it is probable that about 35 per cent of the entire local supply is now being conserved and that it may be feasible to reclaim 65 per cent or 75 per cent, due to the extremely high charge which may be paid for water in that vicinity. On the other hand it may be cheaper to import water from the Colorado River than to reclaim so large a percentage of local supplies.

To get accurate results in investigational work in the entire coastal belt of southern California is extremely difficult because of the peculiar conditions encountered there. Except for San Diego County, practically 90 per cent of the local supplies are utilized by drawing from underground reservoirs which are recharged by rainfall which falls upon them and by percolation from streams which flow across them. The extraordinary dependence upon underground supplies and the existence of such underground supplies bring complications into the problem and data must be gathered for many years before it is possible to draw definite conclusions as to any particular area although it may be very easy to draw a general conclusion as to the entire area.

DIFFICULT PROBLEM

When the imported supplies are brought in the matter of payment by those benefited will be a difficult problem because any water introduced at one point in South Coastal Basin, for instance, will benefit all interests lying below and nothing can be done to guard against this. This may mean that many people will be benefited without paying a proper amount for such benefit.

In anticipation of the problems which will be encountered, the State has been investigating the South Coastal Basin since 1923 and Ventura County since 1927. It is probable that these investigations will be continued for many years to come because it requires authoritative knowledge continuously gathered to solve the problem and because the matter is so extremely important.

The idea behind the State investigation in Ventura County is that a comprehensive plan for utilization of the water of the county in the county may be laid out and development go ahead on that basis until the limit of feasibility is reached. It happens that the boundaries of Ventura County bound the watersheds from which the water supplies of the county come so that while it is not felt that county boundaries should necessarily have anything to do with the matter, the physical conditions make it convenient to speak about a comprehensive plan for Ventura County.

In the South Coastal Basin, investigations have gone further in detail and intensiveness than in any other area, the State supplying between one-half and one-third of the money being spent on the work for development of the facts as to underground water supplies and possibilities of further utilizing local sources of supply. The work is done under the supervision of the Division of Water Resources.

The State has also investigated a route from Colorado River which would supply water to the

Colorado River Supply in Ten Years

(Continued from preceding page)

entire coastal area of southern California including Ventura County, South Coastal Basin and San Diego County and has surveyed a distribution system for such purposes.

The Metropolitan District and the city of Los Angeles have spent about \$2,000,000 or more in extremely detailed investigation and have selected another route entering the South Coastal Basin, however, at the same point as that chosen by the State. Recently a bond issue of \$220,000,000 was voted by the district for construction of an aqueduct. It is understood that by the terms of the bond issue no specific route was approved by the voters.

San Diego City and County have investigated a route coming directly from the proposed All-American Canal for Imperial Valley, crossing through the mountains directly east of San Diego and arriving at the coastal plain at sufficient elevation to water the agricultural land as far north as San Luis Rey River and as far south as the international boundary. At the present time arrangements have been made by the

city and county of San Diego to participate in the construction of the proposed All-American Canal which was previously referred to and thereby securing a portion of its capacity for the conduit in question.

RELIEF IN TEN YEARS

It is apparent therefore that the people of southern California are attacking the problem presented in an aggressive and forcible way and that within ten years at the most, outside supplies will have commenced to arrive in the coastal area. So far only a supply from the Colorado River has been investigated and it is to be doubted whether additional supplies from other sources will be necessary if the entire amount recommended by the Metropolitan District and also the entire amount recommended by the city and county of San Diego is brought in to the area.

The water supply to be imported from Colorado River for southern California ties that area into the great Colorado River problem which has been under discussion for a quarter century back and which is a national problem.

Casualties in Grade Crossing Accidents Cut 10 Per Cent

Money being spent in grade crossing separations in California is an important factor in highway construction work, according to a recent report of the State Railroad Commission.

There are now approximately 550 grade separations of various kinds in the State, including overhead and subway crossings of highways. The report also shows, however, 12,000 grade crossings in the State, as related to more than 2,000,000 motor vehicles in use, some 17,000 miles of main and branch line railways, some 6000 miles of State highways, and many miles of county and city roads.

More than \$3,200,000 was expended in grade separation work in 1929, the report shows. Of this total, the railroads contributed approximately \$1,400,000, the cities \$900,000, about \$480,000 was spent by the counties, and approximately \$450,000 by the State.

As a direct result of this protective work, Railroad Commission figures show a decrease of 6 per cent in grade crossing accidents in California, and a 10 per cent reduction in casualties, during 1930 over 1929. This record is remarkable, it is pointed out, in

view of the increase of approximately 20 per cent in the number of traffic accidents of all kinds occurring on the highways of the State during 1930.

Additional protective devices ordered by the Railroad Commission, greater care on the part of motorists at crossings, and general educational work of motoring organizations and other public bodies are other reasons to which the accident decrease at grade crossings may be attributed, it is said.

MORE CALIFORNIA CARS

California is one of the eight states out of 36 reported showing an increase in passenger car registration during the first six months of this year as compared with a similar period in 1930, it is announced by the California State Automobile Association. California's total registration of passenger cars reached 1,855,236.

Other states sharing in this indicated return of better business conditions include Connecticut, Florida, Maine, Maryland, Massachusetts, New Jersey, and Rhode Island.

When Noah sailed the waters blue,
He had his troubles, same as you;
For 40 days he drove the ark,
Before he found a place to park.

—Jackson Citizen-Patriot.

"Didn't you claim when you sold me this car that you'd replace anything that broke or was missing?"
"Yes, sir. What is it?"
"Well I want four front teeth and a collar bone."
—Boston Transcript.

Building a Highway Brings This Town a Business Boom

“WILLIAMS is in the midst of a temporary prosperity that is of a volume equal to that of many years. The chief cause is the widening and leveling of the ten-mile stretch of the Tahoe and Pacific highway between Williams and Maxwell.”

That was the cheery statement of C. E. King, progressive farmer and stockman of the Williams vicinity, according to an article in a recent issue of the *Woodland Democrat*. King was in Woodland looking after business interests.

“The highway improvement,” said King, “cost about \$30,000 a mile, or around \$300,000. The construction camp is just outside of Williams, but sufficiently near to create a small boom in town during the evenings. Williams perhaps is not only the busiest place in Colusa County at present, but the busiest, to the square inch, in this section of the State.”

IMMEDIATE RELIEF

Sometimes one is led to believe that Federal relief measures, intended for winter, will get to work about midsummer. That is, earmuffs and overcoats may be bought in August.

California moves quickly in common sense way, to ease up on unemployment. The State Highway Commission has appropriated \$1,500,000 to be used to employ a force of between 3500 and 4000 men on highway maintenance work in practically every county.

It is planned to work the men three days a week for a period of five months. Cooperation of the mayors of all cities will be sought in putting the men to work.

Married men with families will be given preference and the work will be performed in the immediate locality where the men reside.

It is the purpose to distribute this work so that every section of California will share in its benefits. Practically all of the \$1,500,000 will go for wages.—*Banning Herald*.

Is “engine” a masculine or feminine word? Depends on whether or not it rirs.

Jack: “Why did you quit calling on Eleanor?”

Fred: “Too many traffic signals.”

Jack: “Tuh?”

Fred: “Her father caught me kissing her and yelled ‘stop’ and then yelled ‘go,’ and her mother hung up a ‘no parking sign.’”

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
JOHN W. HOWE.....Editor

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INVEST IN ROADS

Better roads should be the watchword of all residents of northern California. Highway improvements should be uppermost particularly in the minds of the people of the coast area. With the possible exception of the dairy farms the tourists are bringing more money into this part of the State than any other one source of revenue. The better the roads the more tourists will come. There should be no memory of rough highways in the minds of travelers who have visited our county and returned again to their homes.

The roads of the coast section also should be improved as rapidly as possible because all-weather roads are necessary to the welfare and prosperity of the farmers who live there. The rains will begin coming in a few more weeks. If conditions this winter are as they always have been the rains will make some of the coast section roads absolutely impassable. This should not be.

Good roads are always a good investment. If the cost of better roads is properly distributed and the people who use them most can be made to pay their share of the cost and upkeep then everybody is benefited and nobody is hurt.

The people of the coast district should from this time on be “good road-minded.” But they should not burden themselves with improvements unless an equitable arrangement is made whereby the cost is distributed proportionately among all people who are benefited.—*Santa Rosa Republican*.

AUTOS IN SWEDEN

Sweden had more than 145,000 automobiles at the beginning of 1931, according to the government statistical bureau. In addition there are nearly 57,000 motorcycles. Especially in Stockholm the number of motor cars has grown rapidly. The capital now has more than 20,000 automobiles.

Gallant Rescue of Drowning Bather by Water Division Hero

DURING the recent period in which engineers connected with the stream flow measurement staff of the Division of Water Resources, Department of Public Works, were active, a group of persons were swimming in the Sacramento River above the I Street bridge. These bathers were near the point where two men were employed in recording at periods through the night tidal cycle measurements and river flow readings.

Duncan F. McCallum, junior hydraulic engineer, and William Cross, filling the shift from midnight to 8 a.m. had taken measurements and were recording their notes at 2 a.m. when they became aware of some excitement among members of the swimming party.

On hearing cries for help, both men ran along the shore searching the river with their flashlights. At last, they located a person struggling in the water at some distance from the shore. McCallum immediately plunged into the stream fully clothed, reaching a man who was just about to sink for the third time, and after a considerable struggle succeeded in bringing him to shore.

Then McCallum, assisted by Cross, proceeded with first aid measures to resuscitate the man who was in critical condition and after prolonged effort managed to revive him. When the man was able to speak he told the two engineers that a woman, Verna Pearl Brown had gone down into the water with him and was undoubtedly drowning.

In the meantime a small boat had put out from Wilbro Beach and after a short search the body of the woman was discovered floating in the water. The body was brought ashore and first aid efforts were made to resuscitate her. An emergency call was placed to secure a pulmotor from the Sacramento Fire Department. McCallum and Cross alternated in resuscitation work until about 7 a.m. when the pulmotor arrived from Sacramento but all efforts failed to revive her.

During the alternate spells of first aid work the men continued with the measurements of flow in the river until relieved by the oncoming shift about 8 a.m. McCallum stated modestly that had an alarm been given within sufficient time, it would have been possible to have also saved the woman.

The name of the man successfully rescued is David Schmidt of Sacramento.



DUNCAN F. McCALLUM, junior engineer, Division of Water Resources who plunged into Sacramento River at 2 a.m. and saved the life of a man sinking for the last time.

Highway Engineers to Convene Next Month

C. H. Purcell, State Highway Engineer, announces a meeting of the district engineers and heads of departments of the Division of Highways to be held in Sacramento on November 12 and 13. This is an annual gathering for the purpose of discussing problems of mutual benefit, possible changes in highway standards, the effect of new legislation, and other problems.

Subjects have been assigned to individuals who will prepare papers to be read and then followed by general discussion.

These meetings in the past have resulted in an appreciable amount of benefit and better understanding between headquarters' staff employees and district employees.

Several matters of special importance are expected to be taken up at this meeting.

State Employees of Sacramento Go Over The Top in Community Chest Drive

1 1 1 1 1 1

FIRST in the field and 100 per cent over the top was the record made by the State employees of Sacramento in the Community Chest campaign by each contributing one-quarter of a day's pay per month.

That was the report Governor Rolph was able to make in behalf of his official family, at the end of eight working days to the Chest workers at the luncheon on State Employees' Day, October 22d. The announcement was greeted with prolonged cheering.

"I am prouder than I can say," declared the Governor, "that my own household, the State employees in Sacramento, have responded so promptly and so generously to this most worthy cause."

The appointment by Governor Rolph of James I. Herz, Deputy Director of the State Department of Public Works as his Community Chest Colonel for State departments, was the pre-campaign signal for action by the employees.

A meeting of the Departmental Council of Sacramento Chapter of the State Employees' Association was called immediately and invited Deputy Director Herz and Community Chest officials to address them. In the executive session that followed it was decided to organize at once a subscription campaign among the various department groups to raise an allotted quota of \$31,000, compared with \$9,000 subscribed last year.

THREE TIMES MORE

It was figured that to raise this total—a sum more than three times greater than last year—a subscription amounting to one-quarter of a day's pay per month would be needed from each of the 2100 State employees in the Sacramento district.

With this goal in view and with the advice and encouragement of Mr. Herz a complete Community Chest solicitation organization was formed within the State Employees' Association headed by Spencer Burroughs, president of the Sacramento Chapter and attorney in the Water Resources Division of the Department of Public Works.

The general committee appointed was composed of executives of the Department.

CAMPAIGN COMMITTEE

T. E. Stanton, Highways Materials and Research Engineer and president of the California State Employees' Association, was made chairman of the speakers' bureau, with Fred J. Grumm, engineer of Surveys and Plans, as vice chairman; P. R. Green, chief draftsman, District II, Division of Highways, as secretary; E. R. Higgins, chief accountant, Department of Public Works, treasurer, and L. V. Campbell, office engineer, Division of Highways, chairman of the interdepartmental committee.

The committee membership also included a chairman from each of the nineteen groups of employees, comprising the State departments located in Sacramento.

A schedule of group meetings was promptly arranged at which the objective to be reached by a quarter of a day's pay per month was explained and the amount of the subscription left entirely up to the conscience and financial situation of each individual.

NEED REALIZED

From the outset there was evidenced in every group a general feeling that this year an extra effort ought to be made to supply the Chest with more funds and that every one should go the limit in giving.

The result of this spirit was quickly shown by the returns that came rolling in as group after group reported through their chairman. The departmental drive was begun on October 12th to be continued two weeks. On the first day 437 employees contributed \$8,742. On the second day 442 employees gave \$6,946.20. The third day produced \$6,765.87 and the fourth \$3,214.75 from 281 givers.

At the end of the first week, Colonel Herz was able to report that the total subscriptions had leaped to the generous figure of \$22,454.07. This sum represented 72 per cent of the entire quota and was contributed by 1013 persons.

At the Community Chest noon gathering, October 20th, Colonel Herz proudly announced that the pledges had increased nearly \$3,000 since the preceding day and had reached a total of \$25,668.

U.S. Engineers Study Great Valley Plan

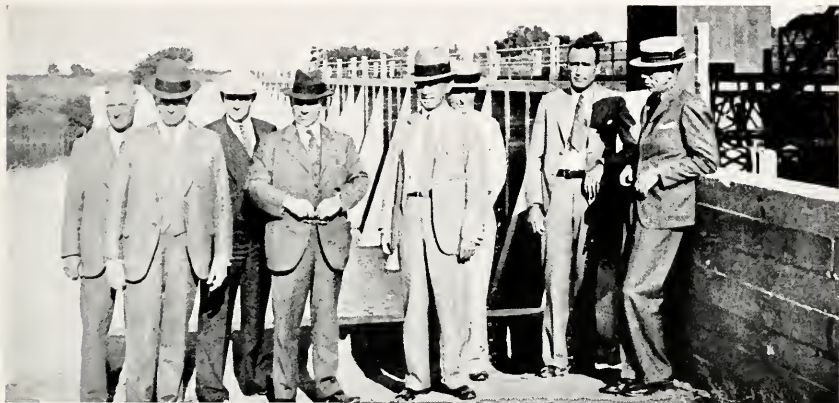
(Continued from page 2)

That the United States Government is interested in solving California's most acute problem, conservation of water, was exhibited in September when members of the United States Board of Engineers for Rivers and Harbors visited California for the particular purpose of obtaining first-hand information on the Great Valley project of the State Water Plan and familiarizing themselves with its principal features.

Four members of this important board, Brigadier General Herbert Deakyne, Colonel Edward H. Schulz,

water problem. The entire Board of Engineers was greatly interested in the project, being familiar with it through the reports, and expressed their appreciation of the opportunity to personally inspect the entire project.

The local problems of water shortage were presented to the United States Board of Engineers at a luncheon meeting given at Fresno under the auspices of the Fresno Chamber of Commerce, at a breakfast given by the Stockton Chamber of Commerce and at



WITH THE ARMY ON SURVEY. This picture of the U. S. Army group that made a three-day tour studying the Great Valley project of the State Water Plan was taken at Mendota weir on the San Joaquin River. Left to right, they are Lieut. Colonel Thomas M. Robins, district engineer, Pacific Division; Brigadier General Herbert Deakyne, Captain Albert B. Jones, Colonel Edward H. Shulz and Lieut. Colonel Warren T. Hannum, members of the United States Board of Engineers for Rivers and Harbors who came from Washington; Major J. R. D. Matheson, California Debris Commission; C. I. Grimm, War Department District Engineer, and Captain W. A. Wood, district office of War Department.

Lieutenant Colonel Warren T. Hannum and Captain Albert B. Jones, made a three-day inspection trip extending from Bakersfield in the southern San Joaquin Valley to Redding at the northern end of the Sacramento Valley. Lieutenant Colonel Thomas M. Robins, division engineer of the South Pacific Division, Major J. R. D. Matheson, member California Debris Commission, Captain W. A. Wood and Mr. C. I. Grimm, principal engineer, District Office of the War Department, accompanied the party.

STUDY GREAT VALLEY PLAN

The War Department has been making an extensive investigation of the Great Valley project and has rendered a partial report to Congress. A final report will probably be submitted about the first of the coming year. The recommendation of the United States Board of Engineers will have an important bearing on Federal participation in the project. General Deakyne was formerly stationed in San Francisco as division engineer and is familiar with California's

a dinner in Sacramento given under the auspices of the Sacramento Chamber of Commerce.

Governor James Rolph, Jr., attended the Sacramento meeting and, in an address to the Board of Engineers, stressed the acuteness of the water problem and the importance of a sound solution of it to the State and the Federal Government, and of the importance of Federal assistance.

MADE RIVER TRIPS

The Board of Engineers, leaving Bakersfield on their inspection trip September 15, 1931, closely paralleled the location of the proposed San Joaquin River-Kern County Canal, inspected the highly developed agricultural areas that have been abandoned through lack of sufficient water and examined the dam site at Friant. From Fresno they came up the west side of San Joaquin Valley, stopping at Mendota Weir, and at the pumping system of the West Stanislaus Irrigation District. The irrigated lands on the west side of San

(Continued on page 30)

Pay Envelopes Vital to Households

(Continued from page 8)

annual report many facts and figures which may be of interest to California highway enthusiasts. Pointed excerpts from his address follow:

"The Federal government is capitalizing the information as to how many people have a livelihood because of increased Federal appropriations for highways, and the states have—many of them for the first time—found that not only the state departments but the contractors have a great army of workers on the roads whose pay envelopes are a vital matter to many a household."

Maine Holds Record

"On the first day of July there was one person employed on state highway work for every 369 people in the nation. (Editorial note: In California, one in every 734.)

"The largest number in any state at that time was one out of every 70 persons in the State of Maine. This has no reckoning of persons employed in road work by townships, counties, or cities, neither does it have anything to do with persons who are employed exclusively in preparing materials to be used in road construction. Likewise, this has no reference to people employed by the Federal government in road work, whether departmental in forests, Indian reservations, public domain or national parks."

"In addition to all this, the fact should not be overlooked that there are many industries scattered throughout the county which would have been closed down if it had not been for the demands made upon them to furnish materials for this road building program."

Surface Mileage Increase

"During the past calendar year the states have increased their surfaced mileage on the state systems by 25,997 miles, but while they were doing that the Legislature added 6390 more miles to the systems, and this had nothing to do with the wholesale job accomplished in North Carolina or the new idea township undertaking in the placid home of William Penn."

"In adding to the surfaced mileage during the past year the types of roads were as follows: gravel 5014, bituminous macadam 1076, bituminous concrete 1065, concrete 9462, and all other types 9380. We started this year with a state system of 321,723 miles; 29 per cent in pavement, a gain of 3 per cent over last year; gravel 31 per cent, a gain of 2 per cent over last year; sand clay and other types 12 per cent, a gain of 3 per cent over last year.

"This leaves 28 per cent still earth roads, or a net gain in surfaced mileage of but 8 per cent. However, this remaining 28 per cent of earth roads is 38 per cent graded to standard and supplied with proper small drainage structures."

Largest in History

"The total income for State Highway Department activities for the last calendar year was \$1,136,673,437. This is the largest income in the history of road building and does not include cash balances of \$286,490,000 distributed among all of the states except one.

"The receipts came from the following sources: 25.9 per cent from motor license fees, 36 per cent from gasoline taxes, 19.5 per cent from bonds, 5.3 per cent from local authorities, 0.9 per cent from state tax levy, 2.8 per cent from direct appropriations, 1.6 per cent miscellaneous, and Federal funds 8 per cent.

"The substantial increase of funds over the previous year came from all sources, and therefore while the Federal funds increased from \$77,572,691 to \$96,462,836 the percentage of Federal funds to the total was slightly less than in 1929."

Price No Measure

"A good road is needed over which to transport a load of wheat or cotton or cattle. The price the merchandise brings is not a measure of the need for the highway. The past year's experience shows that an increased road program not only takes the depression out of the highway, but it is the base course for many a hearthstone. Every part of our governmental structure has its share of responsibility in meeting the issue. The state highway departments are equipped for an increased task."

Samuel Eckels, Chief Engineer, Pennsylvania Department of Highways, in his address on the subject "The Addition of Roads to the State Highway System" described the manner of adding roads to the state highway system of Pennsylvania. He declared in favor of adding roads to state highway systems rather than providing state money for local subdivisions to expend on highways through the local authorities.

The last Pennsylvania Legislature passed legislation providing for the State of Pennsylvania to take over 20,000 miles of township highways for construction and maintenance at the expense of the state. This mileage, combined with the existing state mileage, gives the Pennsylvania Department of Highways a total state system of over 33,000 miles.

Vast Bridge Projects

Dr. D. B. Steinman of New York City, in an illustrated address, pictured the amazing strides made in bridge construction in fifty years. His address was of particular interest to the California delegates in view of the vast bridge projects now being undertaken in this State in constructing the two gigantic structures across San Francisco Bay—one between San Francisco and Oakland via Goat Island, and the other spanning the Golden Gate.

Charles H. Ross, attorney for the North Carolina state highway system, in his address declared that the development of farm-to-market roads is a "national need" for the proper coordination of railroad and motor vehicle transportation.

The last Legislature of North Carolina in a revolutionary piece of legislation turned over to the state highway officials the supervision and control of all county highways, including location, maintenance, and construction. County highway officials were abolished and the local tax theretofore raised for the support of county highway officials does not obtain.

Carolina Sets Precedent

This change in highway control adds 45,000 miles of county roads to be taken over together with all

Important Resolutions Adopted

The report of the American State Highway Officials Committee on Resolutions, of which committee Earl Lee Kelly, Chairman of the California Highway Commission, was a member, was adopted. These resolutions represent the resultant of the combined thought of the convention on a number of highway problems. Among the resolutions of particular interest to western states was one recommending that congressional authorizations for Federal aid highway building be continued for the fiscal years 1934 and 1935 at the rate of \$125,000,000 per year, the "same as provided for the last two fiscal years."

The convention also urged, in a resolution, that the limitation per mile on Federal participation in Federal aid highway construction be eliminated, and that "the Secretary of Agriculture be authorized to approve projects at 50 per cent of the cost of construction." Other resolutions passed were as follows:

"Whereas, The United States numbered routes as heretofore designated by this association, most of which are adequately marked, cover practically all of the main interstate highways in a manner that serves interstate travel satisfactorily to the traveling public; and

"Whereas, There are many associations being formed more or less selfishly and in most cases for profit endeavoring to promote other highways and designating them by names, which highways cross several states and follow for the most part designated U. S. numbered routes, none of which proposed highways will offer any help to the tourist for interstate travel, but only add to confusion by such designation; therefore, be it

"Resolved, That the American Association of State Highway Officials oppose the attempts to designate by names the present orderly system of highways and the naming of proposed highways following the same general lines as designated highways, and that the secretary of this association be directed to so inform each state highway department of the action of this

association taken at this seventeenth annual meeting."

"Whereas, The appropriation of Federal funds of \$3,000,000 for the construction of Federal lands highways across portions of the unreserved Federal lands in the public lands states is for one year only; and

"Whereas, Such appropriation is not sufficient to complete the interstate trunk highways across such areas; now, therefore, be it

"Resolved, By the American Association of State Highway Officials, that further appropriations, at an adequate rate, be provided until the purpose of such appropriations is accomplished."

"Whereas, The progress of construction on the forest highway system is not keeping pace with the progress being made on the Federal aid highways systems because of inadequate funds; now, therefore, be it

"Resolved, By the American Association of State Highway Officials, that annual authorizations for forest highways for the years 1934 and 1935 be continued at not less than the present rate."

county prisoners, prison camps, county road equipment, etc., by the state highway authorities.

Mr. Ross said, in part: "On July 1st of this year, by virtue of an act of the General Assembly of North Carolina of 1931, the control and responsibility for the maintenance and construction of all the public roads in North Carolina except the streets of cities and towns, was vested in the State Highway Commission, to be financed exclusively by motor vehicle and gasoline taxes. From and after that date it

became unlawful for any county or a subdivision thereof to levy any tax or to incur any indebtedness for the purpose of constructing or maintaining any public road or bridge.

"The complete centralization in the hands of one agency of all the public roads of the state is, I believe, without parallel in the legislative history of any of the states of the American Union.

"I submit, therefore, that North Carolina's adventure into the field of local roads points the way to a national need."

(Continued on page 30)

Cheers for the Boys on the Job

Members of Big Meadows Road Crew Help Repair Car of Camper Bound For City

Colonel Walter Garrison,
Director of Public Works,
Sacramento, California.

Dear sir:

Wish to express my appreciation for the good work accomplished by your men located near Big Meadows in assisting me in repairing my automobile which had evidently been tampered with during the night while camped at Big Meadows.

Had it not been for your men (namely Messrs. J. H. Gates, Superintendent Geo. McIvor, Wm. McBirney, Thomas Morales and Robt. Warner), I would have been in dire circumstances as it was very necessary I reach Stockton at an appointed time.

I can not speak too highly for the assistance rendered by these men and it is my desire to thank them as well as yourself for what has been done for me. It has been my pleasure to come in contact with real men.

Sincerely,

HARRY BATES,
Stockton, California.

Mr. Walter E. Garrison,
Director of Public Works,
Sacramento, California.

Dear friend:

We, the undersigned Board of Supervisors of Amador County, most heartily commend you and Mr. R. E. Pierce of Division 10 for the wonderful highway that you have just completed from Amador City to Martell.

It is a pleasure to travel this highway, we assure you, after traveling the old road so many years, which was so dangerous, and eliminating the steep grades.

We also want to thank you and Mr. Tom Dennis of the Maintenance Department for the wonderful surface that you have put on the highway from the Sacramento County line to Drytown.

We assure you that we voice the feelings of the people of Amador County and all who travel these highways, as we have heard so many favorable comments on the wonderful work your department has given our county.

If we can be of any assistance to you or your staff at any time, do not fail to call upon us.

Again thanking you and your staff, we remain,

Yours very truly,

D. V. RAMAZZOTTO, chairman,
JOHN ORR,
ARTHUR CLIFTON,
FRANK DEVENCENJI,
V. S. GARBARINI,
Board of Supervisors of Amador
County.

Road Foreman Works Through Rainy Night Rescuing Mired Cars On Mountain Road

Mr. E. Q. Sullivan, District Engineer,
Division of Highways,
San Bernardino, California.

Dear sir:

While on our way up to Lake Arrowhead on or about the night of September 1st, upon leaving San Bernardino, an extremely heavy rain started falling—by the time we reached Waterman Canyon, the electrical and rainstorm was terrific.

At a place called "Cholo Point" the road was completely inundated with mud, water, and rocks, and every car going in either direction immediately stalled.

After being hopelessly mired for some time, a man; one J. D. Moore appeared, who quickly distributed red lanterns about the wash in, and proceeded to obtain a large tractor which after infinite labor in a heavy downpour of rain was finally started and warmed up.

Mr. Moore then got busy, and despite personal discomforts and a thorough wetting; cheerfully and efficiently pulled a dozen or more cars to solid ground, where they might proceed after being stalled for some three hours.

We thought Moore should be rewarded with something more substantial than "thanks"—but he simply evaded by saying: "It's all in the day's work."

It would greatly please us if you would at some time convenient to yourself, personally express our appreciation and gratitude to this man, Mr. Moore, for his help on that night.

Yours truly,

THOS. H. BLOOMINGDALE,
Monterey Park, California.

State Highway Engineer,
Associated Realty Building,
Los Angeles, California.

Dear Sir:

I am taking this opportunity to express the appreciation of the Escondido people for the very good and very much needed work that has been done on the Inland Highway, near Escondido, by your road superintendent, Mr. Martin.

Some very bad bumps in the pavement have been taken out, and the shoulders smoothed, and the sides of the road cleared of weeds, so that it makes a very different highway. * * *

I've had a great many people stop in the Chamber of Commerce and comment on the work which has been done since your crew has been down here, so felt you would appreciate having the information.

Yours very truly,

MRS. PANSY P. CLAGGETT,
Secretary Escondido Chamber of Commerce,
Escondido, Calif.

Redwood Empire Association in Annual Meeting Plans Campaign for 1932

THAT highway development and the present crying need for relief of the unemployment situation go hand in hand, was the sense of an address by Colonel Walter E. Garrison, director of the State Department of Public Works, that was one of the highlights of the eleventh annual convention of the Redwood Empire Association at Sonoma Mission Inn last Thursday, Friday, Saturday and Sunday.

Colonel Garrison's address was delivered at the eleventh annual banquet of the Association Saturday evening where he and Earl Lee Kelly of Redding, chairman of the California Highway Commission, were among the principal speakers.

Chairman Kelly went to the convention as the personal representative of Governor James Rolph, Jr., who, because of a previous engagement, was unable to attend.

REPRESENTATIVE GROUP

Dr. Joseph M. Toner, Director of the California State Department of Institutions, was toastmaster at the banquet and a representative group of State officials were at the speakers' table, including Wallace Ware of Santa Rosa, State Civil Service Commissioner; State Highway Engineer C. H. Purcell; Highway Commissioner Timothy A. Reardon of San Francisco; Eric Cullenward, Chief of the Bureau of Publications and Documents, and Chief E. Raymond Cato, Division of Enforcement, Motor Vehicle Department.

Federal officials at the table were Dr. L. I. Hewes, Deputy Chief Engineer, United States Bureau of Public Roads, and his assistant, Levant Brown.

The convention, itself, was the biggest and best attended in the association's history, the unanimity all important matters considered at the many business sessions and meetings on Friday and Saturday, revealing in a striking manner the confidence and trust placed by the nine empire counties in the single leadership of the Redwood Empire Association.

At the annual meeting Saturday afternoon Harry Lutgens of San Rafael, newspaper publisher, one of the senior members of the

executive board of the Redwood Empire Association, Golden Gate Bridge director and leader in north bay county affairs, was unanimously elected president to succeed Edward Morris, of Willits.

TRIBUTE TO MORRIS

Mr. Morris, who had served as the association's chief executive for four successive years, was paid a glowing tribute upon his retirement. At Saturday night's banquet the officers and directors presented him with a handsome silver watch, suitably engraved with an expression of their appreciation and esteem. The presentation was made by Elliot M. Epstein, attorney for the association, who outlined the unselfish and fruitful efforts of Mr. Morris in behalf of the Redwood Empire Association.

22 MILES RECOMMENDED

Of wide general interest was the decision arrived at by the Shoreline Highway Association, in session Saturday morning with Newton P. Howe, of Point Arena, presiding, to recommend the incorporation of 22 miles of the Redwood Empire Shoreline Highway between Navarro and Fort Bragg into the State Secondary Highway System.

This recommendation was transmitted to the Nine Counties Highways Committee which met immediately following the Shoreline Highway Association and was later approved by the association. It will be taken up with the State Department of Public Works for inclusion in the 1933 biennium budget.

Other important highway matters recommended by the Nine Counties Committee and approved by the association included the relocation of the Redwood Highway between Waldo and Sausalito and through Sausalito to the present ferry terminals to break the so-called Sausalito "bottle neck"; realignment of the Redwood Highway through San Rafael, Petaluma and Santa Rosa to eliminate curves and speed up traffic; highway improvements in Del Norte County, including from Wilson Creek to The Bluffs, Crescent City south on the beach and reconstruction of Route 71, Coast Highway from Crescent City to the Oregon line.

U. S. Bureau Chief Discusses Federal Aid Allotments

(Continued from page 27)

Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads, of Washington, D. C., delivered an address on the topic: "Relation of Highway Building and Utilization." It may not be amiss at this point to digress to mention a complimentary reference made to Mr. MacDonald at one of the banquets by United States Senator Reed Smoot, indicating the influence of Mr. MacDonald as head of the Federal Bureau of Public Roads on highway legislation at the national capitol.

Senator Smoot's tribute to Mr. MacDonald, which was an oral addendum to a written speech, struck the most popular chord of all, judged by the applause.

"Thank God," said Senator Smoot, "we have one man in the governmental service who, when he asks for an appropriation, has a reason and states it so clearly and with proof so convincing that there is little chance to refuse."

Space permits the inclusion of only salient paragraphs of Mr. MacDonald's address:

Federal Aid Employment

"The July employment on the state and Federal aid road programs of 386,000 men directly means a total of employment equivalent to 1,158,000 people. May, June, July and August held reasonably near this amount of employment."

In discussing Federal aid and the emergency appropriation of \$80,000,000 made by Congress last December, he said:

"In five months the \$80,000,000 advance fund, together with \$160,000,000 regular Federal aid and state funds, totaling \$240,000,000 had been put to work on wholly new work to provide employment in all the states.

"The states also continued construction and maintenance programs from state funds, and there are numerous uncompleted Federal aid projects carried over from the preceding year."

Federal Aid Program

On the 1st of July, 1931, the total going Federal aid program, including emergency and state funds, amounted to a total cost of about \$447,500,000, of which the total Federal share was \$275,250,000."

In discussing the actual employment furnished, Mr. MacDonald stated:

"Starting with a total of 148,600 employed on the state and Federal highway programs in January, 1931, there was a rapid increase as weather conditions permitted. In May the total passed 300,000, for July it was 386,659, and the August preliminary figure was 384,000. In July, 164,691 were employed on Federal and Federal aid projects, 112,681 on state and state aid construction, and 109,287 on maintenance. Figures for county and local work are not available.

More Mileage Needed

"Certain characteristics of the highway work for the last two years are worthy of note. Increased employment has been provided when most needed. Expansion of road building is sound, since adequate highways have not been overproduced and many miles more are needed.

Army Engineers Make Three Day Tour on Water Inspection

(Continued from page 25)

Joaquin Valley and the "grass lands" were viewed en route.

From Stockton a trip through the delta to Rio Vista was made on the United States Engineer Corps launch inspecting river and levee conditions in the delta and examining the construction under way on the Stockton Ship Canal. After leaving Rio Vista the party motored along the Sacramento River viewing flood control and navigation conditions, and inspecting weirs, by-passes and levees of the flood control system.

On the following day, examination was made of the flood control project north of Sacramento, continuing to Red Bluff where the Iron Canyon and Table Mountain dam sites were visited and examined. The Kennett dam site was also examined and the site and foundation conditions inspected.

Colonel Walter E. Garrison, Director of Public Works, State Engineer Edward Hyatt, Deputy State Engineers A. D. Edmonston and R. L. Jones, G. H. Jones, Raymond Matthew and T. B. Waddell of the Division of Water Resources, and Assemblyman Chester M. Kline, member of the Joint Legislative Water Resources Committee, were present on all or part of the trip and presented to the United States Board of Engineers the conditions of water shortage existing in the Great Valley and described features of the State Water Plan.

Public Prosperity Linked to Highways

The history of civilization is in large measure a story of the development of transportation. The story of public prosperity is linked with the public highway. So far as land communication is concerned, the fundamental agency, throughout this story, has been the public highway. For a period brief as history goes, it declined into merely local importance. The stage coach and public truckman gave place almost completely to the steam railroad. But during the past twenty years, the motor vehicle has brought back these carriers and has so expanded and intensified highway transportation as to make it, at least in certain fields, a formidable and often successful rival of the railway train. What another twenty years may bring in the development of the airways one dare not predict. But it is safe to say that the public highway will remain a prime necessity to a world increasingly dependent upon quick and economical transportation—a prime necessity, that is, to public prosperity.—*Mississippi Highways.*



Important amendments to the California irrigation district laws passed by the last Legislature and approved by Governor Rolph relative to the issuance and payment of bonds are described and explained in the official September report of the Division of Water Resources under State Engineer Edward Hyatt. Other activities of the division concerning water storage, conservation and irrigation, inspections, dam applications, flood control and maintenance are recounted in the report as follows:

Some 37 amendments to the California irrigation district laws were passed by the 1930-1931 Legislature and approved by Governor Rolph. Among the most important were those connected with the procedure for the issuance and payment of bonds. Under the law as now in effect any bond issue may be made to mature either serially or all at one time, and the maximum period for redemption has been extended to 50 years. Revenues for bond payments may be based in whole or in part on proceeds derived from contracts for the sale of water and/or electricity or from any other sources other than assessments, and such revenues when so allocated can not be used for any other purpose.

Irrigation districts may purchase with surplus funds any bonds not yet due, without advertising for bids. Provision is made for the direct exchange of district bonds for canals, irrigation works or other property. Some changes are also made in the procedure for assessment. Districts are permitted to collect a stand-by charge for service whether water is used or not. Assessments for depreciation are authorized. Authority is also given the directors to accept a partial redemption of land sold for delinquent assessments.

REVISING BULLETIN

The Division of Water Resources is engaged in a revision of Bulletin 18, "California Irrigation District Laws," which bulletin will embrace the California District Securities Act of 1931; also the California Irrigation District Act (and related laws), the Water Storage District Act, the Conservation District Act of 1923, the Conservation District Act of 1929, the Water District Act, and the County Water District Act, all as amended to 1931. These acts provide different forms of public organizations for the conservation of water by community effort.

Bulletin 21-B, a report on California irrigation districts for the year 1930, has been released. This is the third bulletin of this character issued by the State since 1928, and is published for the purpose of bringing up to January 1, 1931, authentic historical and statistical data on California irrigation districts, and

recording such other information as was obtained on irrigation district activities in 1930. There are 17 major reservoirs in use by irrigation districts, with capacities ranging from 2000 to 286,000 acre-feet, and with a total combined capacity of 1,210,000 acre-feet. Water stored in 1930 amounted to 695,000 acre-feet, or about 57 per cent of the combined capacities of the reservoirs. Diversions reported were 6,109,237 acre-feet by gravity, and 644,205 acre-feet pumped from streams and 339,841 from wells. The total water diverted in 1930 was 7,093,283 acre-feet of which 74.7 per cent was reported as distributed for irrigation and domestic use. The total cropped area reported was 2,168,713 acres of which 1,789,887 acres were irrigated. Thirty-four thousand acres more than for the previous year were irrigated. The districts contain a total estimated population of 324,000.

FIELD VISITS

Field visits for the purpose of conference or investigation of matters in their interest were made to the following districts: Walnut, Palmdale and Litterlock Creek irrigation districts, Los Angeles County; Newport Heights and Newport Mesa irrigation districts, Orange County; Bard Irrigation District, Imperial County; Beaumont Irrigation District, Riverside County; Alpaugh, Alta, Terra Bella, Vandallia and Lindsay-Strathmore irrigation districts, Tulare County; Fresno, Foothill, Tranquillity, James, Stinson, Riverdale, Consolidated and Laguna irrigation districts, Fresno County; Merced and El Nido irrigation districts, Merced County; Turlock Irrigation District, Stanislaus County; Hollister Irrigation District, San Benito County; East Contra Costa Irrigation District, Contra Costa County; Fair Oaks, Carmichael and Citrus Heights irrigation districts, Sacramento County.

DAMS

To date 774 applications have been received for approval of dams built prior to August 14, 1929; 84 applications for approval of plans for construction or enlargement and 180 applications for approval of repairs.

Applications for Approval of Plans for Construction of Dams.

Dam	Owner	County
Bigelow Lake	Tuolumne County	Tuolumne
Buck Lake	Tuolumne County	Tuolumne
Emigrant Lake	Tuolumne County	Tuolumne
Emigrant Meadows	Tuolumne County	Tuolumne
Long Lake	Tuolumne County	Tuolumne
Pulp Mill Diversion	Pacific Gas and Electric Co.	Placer
Iron Gate	California-Oregon Power Co.	Siskiyou
Irvine Conservation	The Irvine Company	Orange

The Iron Gate dam to be built by the California-Oregon Power Company will be located on the Klam-

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\$2,700,000 for Through City Routes

(Continued from page 5)

revenues, limited the amount of such work. It was not until 1925 that definite legislation was provided for improvement of routes through cities at State expense. This, however, applied only to municipalities of less than 2500 population.

FOR THROUGH ROUTES

Primary function of the State highways is to provide for statewide or through traffic. Since such traffic uses routes through incorporated cities, the State Highway Department recognized that providing the proper service to this traffic extended the State's responsibility into the municipality. Accordingly there was included in the present highway budget for the 83d and 84th fiscal year biennium, liberal appropriations for improvement within municipalities of through routes.

The total of these appropriations is \$2,700,000. Some of this appropriation was budgeted in definite amounts to projects within cities for which agreements had been reached when the budget was prepared in December, 1930. The remaining amounts were based on estimates of tentatively suggested projects.

COOPERATIVE BASIS

All of these appropriation were set up on a cooperative basis, since both the municipality and the State are called on to assume responsibility. Traffic can be divided into two classes: Local and through. Local traffic is that class which operates on city streets with the purpose of transacting business with establishments fronting thereon. Provision for its accommodation is unquestionably the obligation of the local authority. Through traffic, or that class which is passing through the locality to another destination, should be cared for by the State.

On these fundamental principles is based the policy adopted by the State Division of Highways for cooperative participation in the improvement of routes through cities connecting State highway routes.

The authority and responsibility of the State Highway Commission concerning work within municipalities is definitely set forth in chapter 807 of the 1931 statutes, as follows:

HERE'S THE LAW

"Whenever the natural course of a State highway or State highway system runs or passes into

or through any municipality or contiguous municipalities the California Highway Commission shall have authority to complete such State highway or State highway system as a continuous highway or system and connect the portions of such highway or system on either side of such municipality and shall have authority to determine the location of such connecting portion either through or around the municipality as the commission may determine will be of the greatest benefit to traffic upon such State highway.

For the purpose of so completing any State highway or State highway system, the California Highway Commission shall have authority to acquire the necessary rights of way either within or without the corporate limits of a municipality by purchase, condemnation, or donation and to construct or improve such connecting portion to the same width and to the same standard as the State highway on either side of such municipality and the expense of any said acquisition, construction, or improvement may be paid out of any funds appropriated or available for the acquisition of rights of way, construction or improvement of said State highway or portion of the State highway system.

The legislative body of any municipality upon request of the California Highway Commission shall have authority to acquire any land or right of way by purchase, condemnation or donation needed for State highway purposes and lying within such municipality and the title to any said land or right of way may be taken in the name of the State or municipality and said municipality may also aid in the construction or improvement of any State highway therein by contributing any part of the expense thereof to the California Highway Commission out of any municipal funds available for the construction or improvement of streets within said municipality."

HERE'S THE PRACTICE

The policy adopted conforms to the provisions of the enactment. It is as follows:

"Upon the request of the city authority by proper resolution, the California Highway Commission will determine the location of a routing connecting the highways on either side of such municipality to form a continuous highway or highway system as will be of the greatest benefit to traffic upon such State highway; will adopt and take over such routing; will construct or improve such connecting portion to the same width or to the same standard as the State highway on either side of such municipality, paying for such improvement with State funds appropriated or available for such purpose.

On State highways which are main traffic routes, the municipality will be required to furnish to the State a right of way 80' in width, free of encumbrances and obstructions, and usable only for road or highway purposes. Sidewalk space, if desired, is to be provided by the municipality in addition and outside of the 80' right of way. The intent and purpose of this provision is that ultimate

Primary Needs all Revenues up to 1940

(Continued from preceding page)

development of the highway may be carried to a 76' width between curbs.

On State highways of less importance and carrying a limited volume of traffic, a modification of the above requirement may be made to the extent that sidewalk space may encroach on the 80' right of way but only to the extent that a 56' ultimate width of roadway is provided.

Where it is clearly evident that State or through traffic is sufficiently benefited or benefited in greater proportion than will be local traffic, the State may consider sharing in the cost or in the removal of obstructions of the 80' right of way.

Construction of curbs and sidewalks and the improvement by paving or surfacing of the remaining width of roadway between curbs not improved by the State will be an obligation of the municipality and should be defrayed from municipal funds available for such purpose. Installation, removal, or renewal of water, sewer, gas, and such other facilities under municipal jurisdiction shall be done at the expense of the municipality.

Upon completion of the improvement of the routing, the city is to resume jurisdiction and take back the improved routing and maintain the same."

TOTALS VAST SUM

On the basis of the provision in the new enactment that the State construct and improve the connecting route within the city to the same width and standard as the State highway on either side of the municipality, the total amount of State construction cost on the 457 miles of city thoroughfares, not including right of way or major structures, can be roughly approximated at from \$20,000,000 to \$25,000,000.

Over what period of time appropriations by the State must be continued to defray this total is difficult, at this time, to determine.

Our estimates of revenues and cost of bringing the State highway system to satisfactory standard for a ten-year period, as reported to the 1931 session of the Legislature, show that all revenues now accruing to the State for highway purposes, up to 1940, are necessary to bring the primary highways to adequate standard and that secondary highways will require a longer period for sufficient revenue to accumulate for their completion.

MODIFIES TIME PERIOD

The volume of traffic adjacent to and within the cities on State highway routings and consequent necessity for providing adequate service, established such projects as rather important ones in the State highway program. Comparisons of the relative importance of

such city projects and those on the State highway system will determine in a measure, their inclusion and place on the program and require a modification of the time period indicated above.

A misapprehension of the total amount of money available for expenditure on the State highway system may have been created by an incorrect understanding of the reports of the Board of Equalization estimates of assessment on gasoline, and the amount of revenues accruing to the State for State highway purposes. The present biennium setup, known as the 83d and 84th fiscal year biennium, extending from July 1, 1931, to June 30, 1933, may serve as an example of how this revenue is applied.

It is estimated that the total revenues for the two-year period for State highway purposes will amount to approximately \$63,322,500. This total is made up of the State's share of the original 2 cents gas tax, motor vehicle license fees, and motor bus franchise fees, amounting to \$31,522,500 for the two-year period; the 1 cent gas tax for construction purposes, amounting to \$23,400,000 and Federal aid estimated at \$8,400,000.

This last amount must first be earned by completion of construction projects before it is paid to the State. The amount available for allocation to actual construction and reconstruction projects out of this total, is \$39,362,744, or 62.17 per cent. Maintenance of the highways must be provided, which requires 21.38 per cent of the total revenue.

The law provides for a joint highway district fund, which amounts to 10 per cent of and is deducted from the revenue available for construction of secondary highways. Right of way makes up a considerable item. Preliminary engineering, construction engineering, and administration must also be provided for from this grand total of available revenues before construction projects can be budgeted. The basis on which the revenues are divided for various purposes, such as reconstruction, primary construction, secondary construction, are determined by law.

Prospective Maid: I'd like to work for you, ma'am, but you've only got a two-car garage. Where'd I put my car?

Mistress: Oh, well, you'd never do at all. We're in the habit of employing only servants who have their private chauffeurs.

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of September, 1931.

INYO COUNTY—Big Pine Creek Reservoir Nos. 1 and 6-19. City of Los Angeles, Los Angeles, owner; rock, 4 feet above streambed with a storage capacity of 27 acre-feet, situated on Big Pine Creek tributary to Owens River in Sec. 33, T. 9 S., R. 32 E., M. D. B. and M., for storage purposes, for power and irrigation use.

LOS ANGELES COUNTY—Lovejoy Dam No. 783. Alexander Stewart, Palmdale, owner; concrete, 21 feet above streambed with a storage capacity of 46 acre-feet, located in Sec. 16, T. 6 N., R. 9 W., S. B. B. and M., for storage purposes, for irrigation use.

SAN MATEO COUNTY—Lake Elizabeth Dam No. 697-3. Humphrey Estates, Inc., Pescadero, owner; earth and rock dam, 20 feet above streambed with a storage capacity of 157 acre-feet, situated on unnamed ravine tributary to Cascade Creek in Sec. 20, T. 9 S., R. 4 W., M. D. B. and M., for storage purposes, for irrigation use.

NEVADA COUNTY—Pontoon Dam No. 61-15. Nevada Irrigation District, Grass Valley, owner; timber, 21 feet above streambed with a storage capacity of 140 acre-feet, situated on Canyon Creek tributary to South Yuba River in Sec. 13, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for various uses.

Applications for approval of plans and specifications for construction or enlargement of dams.

TUOLUMNE COUNTY—Emigrant Lake Dam No. 550-3. Tuolumne County, Sonora, owner; gravity, 7 feet above streambed with a storage capacity of 1491 acre-feet, situated on North Fork of Cherry Creek tributary to Tuolumne River in Sec. 30, T. 4 N., R. 21 E., M. D. B. and M., for storage purposes, for fish conservation use. Estimated cost \$600, fees paid \$20.

TUOLUMNE COUNTY—Upper Emigrant Lake Dam No. 550-4. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed with a storage capacity of 160 acre-feet, situated on North Fork of Cherry Creek tributary to Tuolumne River in Sec. 11, T. 4 N., R. 21 E., M. D. B. and M., for storage purposes, for fish conservation use. Estimated cost \$300, fees paid \$20.

TUOLUMNE COUNTY—Long Lake Dam No. 550-5. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed with a storage capacity of 520 acre-feet, situated on West Fork of Cherry Creek tributary to Tuolumne River, for storage purposes, for fish conservation use. Estimated cost \$600, fees paid \$20.

ORANGE COUNTY—Irvine Conservation Dam No. 793-3. Irvine Company, Tustin, owner; earth, 28.5 feet above streambed with a storage capacity of 16,846 acre-feet, situated on stream tributary to Newport Bay, located in Lot 442, Block 57, Irvine's Subdivision. Estimated cost \$155,000, fees paid \$1,275. For storage purposes, for irrigation use.

LOS ANGELES COUNTY—Bouquet Canyon Dam No. 6-31. City of Los Angeles, Los Angeles, owner; earth, 200 feet above streambed with a storage capacity of 36,200 acre-feet, situated on Bouquet Creek tributary to Santa Clara River in Sec. 29, T. 6 N., R. 14 W., S. B. B. and M., for storage purposes, for municipal use. Estimated cost \$3,007,586, fees paid \$7,507.59.

LASSEN COUNTY—Loosley Pool Dam No. 258. F. H. Vestal, Pittville, owner; flashboard, 4 feet above streambed with a storage capacity of 500 acre-feet, situated on Pit River tributary to Sacramento in Sec. 18, T. 37 N., R. 6 E., M. D. B. and M., for diversion purposes, for irrigation use. Estimated cost \$300.

Applications for approval of plans and specifications for repair or alteration of dams.

NAPA COUNTY—Lake Camille Dam No. 1-5. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Fire Dam No. 1-7. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Napa Middle Reservoir No. 1-8. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Napa Upper Reservoir No. 1-9. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

SACRAMENTO COUNTY—Martin Dam No. 451. Hutchison et al, Slough House, owner; gravity, situated on Cosumnes River tributary to San Joaquin River in Sec. 35, T. 8 N., R. 8 E., M. D. B. and M.

SANTA CRUZ COUNTY—San Vicente Dam No. 632-2. Coast Dairies and Land Company, Davenport, owner; gravity, situated on San Vicente Creek in Rancho San Vicente and Arroyo de la Laguna.

LASSEN COUNTY—Buckhorn Dam No. 238. James L. Humphrey, Reno, owner; earth, situated on Painter Creek in Sec. 31, T. 36 N., R. 17 E., M. D. B. and M.

SOLANO COUNTY—Lake Chabot Dam No. 441. Vallejo Water Company, Oakland, owner; earth, situated on Blue Rock Spring tributary to Sulphur Springs, 1 1/2 miles north of Vallejo.

NEVADA COUNTY—Pontoon Dam No. 61-15. Nevada Irrigation District, Grass Valley, owner; timber, 21 feet above streambed with a storage capacity of 140 acre-feet, situated on Canyon Creek tributary to South Yuba in Sec. 13, T. 18 N., R. 12 E., M. D. B. and M.

EL DORADO COUNTY—Fallen Leaf Lake Dam No. 461. Anita M. Baldwin, Los Angeles, owner; concrete, situated on Taylor Creek tributary to Lake Tahoe in Sec. 1, T. 12 N., R. 17 E., M. D. B. and M.

SAN MATEO COUNTY—Burlingame Dam No. 611. California Water Service Company, San Francisco, owner; earth, situated on unnamed stream tributary to San Francisco Bay.

BUTTE COUNTY—Concow Dam No. 67. Thermalito and Table Mountain Irrigation Districts, Oroville, owner; arch, situated on Concow Creek tributary to West Branch Feather River in Sec. 15, T. 22 N., R. 5 E., M. D. B. and M.

MODOC COUNTY—Lauer Dam No. 128-2. Frank McArthur, Alturas, owner; earth dam, situated on unnamed drainage tributary to North Fork Pit River in Sec. 15, T. 44 N., R. 13 E., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of September, 1931.

LOS ANGELES COUNTY—Verdugo Wash No. 32-4. Los Angeles County Flood Control District, Los Angeles, owner; earth, 32 feet above streambed with a storage capacity of 108 acre-feet, situated on Verdugo Creek tributary to Los Angeles River in Rancho San Rafael, for debris storage purposes.

PLACER COUNTY—Pulp Mill Dam No. 97-106. Pacific Gas and Electric Company, San Francisco, owner; arch, 20 feet above streambed with a storage capacity of 1 acre-feet, situated on Canyon Creek tributary to North Fork American River in Sec. 36, T. 16 N., R. 10 E., M. D. B. and M., for diversion purposes, for power and irrigation use.

LOS ANGELES COUNTY—North Side Water Company Dam No. 782. North Side Water Company, Walnut, owner; earth dam, 8 feet above streambed with a storage capacity of 12 acre-feet, situated on South Fork San Jose Creek tributary to San Gabriel River in Rancho San Jose, for storage purposes, for irrigation use.

SAN DIEGO COUNTY—Monte Vista Dam No. 845. Sefton Investment Company, San Diego, owner; earth dam, 35 feet above streambed with a storage capacity

(Continued on page 44)

September Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of September, 1931.

TRINITY COUNTY—Application 7067. Buckeye Placer Mines, Inc., c/o N. W. Curson, president, Carrville, for 15 c.f.s. and 500 ac. ft. per annum from Little Boulder Creek tributary to Coffee Creek, thence Trinity River to be diverted in Sec. 15, T. 37 N., R. 8 W., M. D. B. and M., for mining purposes. Estimated cost \$12,500.

SISKIYOU COUNTY—Application 7068. L. E. Hallford, Happy Camp, for 3 c.f.s. from Phillips Gulch tributary to Oak Flat Creek, thence Klamath River to be diverted in Sec. 30, T. 16 N., R. 7 E., H. B. and M., for mining purposes. Estimated cost \$2,000.

LAKE COUNTY—Application 7069. E. P. Smith, Lakeport, for 0.2 c.f.s. and 5 ac. ft. per annum from an unnamed stream tributary to Clear Lake (through Clover Creek and Middle Creek) to be diverted in Sec. 15, T. 15 N., R. 9 W., M. D. B. and M., for irrigation and domestic purposes. (30 acres.) Estimated cost \$1,000.

EL DORADO COUNTY—Application 7070. George E. De Golia, 5960 Contra Costa Road, Oakland, for 200 gallons per day from unnamed stream tributary to South Fork of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes.

STANISLAUS COUNTY—Application 7071. Joe V. Cardozo, c/o Nathan B. McVay, atty., California Bldg., Modesto, for 1.0 c.f.s. from Stanislaus River tributary to San Joaquin River to be diverted in Sec. 29, T. 2 S., R. 8 E., M. D. B. and M., for irrigation purposes. (80 acres.) Estimated cost \$1,500.

NEVADA COUNTY—Application 7072. Relief Hill Mining Co., c/o Fletcher Hamilton, agent, North Bloomfield, for 100 c.f.s., 25 c.f.s. from each source, from (1) Rob Roy, (2) Deadman, (3) Roscoe and (4) Logan Canyons tributary to (1) and (2) Poormans', (3) and (4) South Fork of Yuba River to be diverted in Sec. (1) 25, (2) 26, (3) and (4) 34, T. 18 N., R. 10 E., M. D. B. and M., for mining and domestic purposes.

SAN BERNARDINO COUNTY—Application 7073. Arlington Mining Corporation, 740 South Broadway, Los Angeles, for 0.5 c.f.s. from Arrastre Creek tributary to Mojave Desert to be diverted in Sec. 27, T. 3 N., R. 2 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$25,000.

EL DORADO COUNTY—Application 7074. J. H. Blamey, 2417 22d St., Sacramento, for 200 gallons per day from Cody Creek tributary to Strawberry Creek, thence South Fork of American River to be diverted in Sec. 19, T. 11 N., R. 17 E., M. D. B. and M., for domestic purposes. Estimated cost \$75.

TRINITY COUNTY—Application 7075. Lee Nafzgar, Del Loma, for 6 c.f.s. from Langs Creek tributary to Trinity River to be diverted in Sec. 31, T. 5 N., R. 8 E., H. B. and M., for mining and domestic purposes. Estimated cost \$5,000.

NEVADA COUNTY—Application 7076. Edward Bickel, P. O. Box 881, Nevada City, for 15 c.f.s. from Little Greenhorn Creek tributary to Greenhorn Creek, thence Bear River to be diverted in Sec. 4, T. 16 N., R. 10 E., M. D. B. and M., for mining and domestic purposes.

EL DORADO COUNTY—Application 7077. R. G. Sproul and S. B. Freeborn, c/o S. B. Freeborn, Davis, for 600 g.p.d. from unnamed stream tributary to Upper Echo Lake to be diverted in Sec. 34, T. 12 N., R. 17 E., M. D. B. and M., for domestic purposes.

TEHAMA COUNTY—Application 7078. Thomas J. Fellow, 409 45th St., Oakland, for 0.037 c.f.s. from unnamed stream tributary to North Fork of Elder Creek, thence Elder Creek and Sacramento River to be diverted in Sec. 34, T. 12 N., R. 7 W., M. D. B. and M., for irrigation and domestic purposes. (1 acre.) Estimated cost \$300.

VENTURA COUNTY—Application 7079. Harry D. Howell and Eugenia J. Howell, c/o Clarke and Bowker, attys., 1216 Title Guarantee Bldg., Los Angeles, for 1/2 miners inch (0.0125 c.f.s.) from unnamed spring

tributary to Sisar Creek, thence Santa Paula Creek and Santa Clara River to be diverted in Sec. 31, T. 5 N., R. 21 W., S. B. E. and M., for domestic purposes. Estimated cost \$300.

EL DORADO COUNTY—Application 7080. B. W. Stone, 161 Ellis St., San Francisco, for total of 500 c.f.s. and 125,000 ac. ft. per annum from (1) Rubicon River, (2) Pilot Creek, (3) Gerle Creek, (4) Leon Lake, (5) Buck Island Lake, (6) Rock Bound Lake, (7) Little South Fork of Rubicon River tributary to American River Drainage to be diverted in Sec. 9, T. 13 N., R. 16 E.; Sec. 11, T. 12 N., R. 12 E.; Sec. 24, T. 13 N., R. 13 E.; Secs. 1, 31 and 34, T. 14 N., R. 14 E.; Sec. 4, T. 13 N., R. 15 E.; Sec. 2, T. 13 N., R. 14 E., M. D. B. and M., for municipal purposes.

PLACER COUNTY—Application 7081. Butte Mining Co., c/o Jas. P. Sweeney, atty., 681 Post St., San Francisco, for 30 c.f.s. from West Branch of El Dorado Creek tributary to North Fork of Middle Fork of American River to be diverted in Sec. 26, T. 15 N., R. 11 E., M. D. B. and M., for mining purposes. Estimated cost \$30,000.

PLUMAS COUNTY—Application 7082. R. A. Snyder, F. Anderson and A. Mattson, c/o Wm. Watson, C. E. Quincy, for 3 c.f.s. from South Fork of Poormans Creek tributary to Hopkins and Nelson Creeks to be diverted in Sec. 3, T. 22 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$250.

TULARE COUNTY—Application 7083. The Regents of the University of California, a corp., c/o Calkins, Hagar, Hall and Linforth, attys., Crocker Bldg., San Francisco, for 1.0 c.f.s. from two small forks of Esham Creek tributary to Esham Creek, thence Kaweah River to be diverted in Sec. 16, T. 14 S., R. 28 E., M. D. B. and M., for domestic and recreational purposes. Estimated cost \$1,100.

SISKIYOU COUNTY—Application 7084. Marshall M. Crawford, Happy Camp, for 12.5 c.f.s. from China Creek tributary to Klamath River to be diverted in Sec. 9, T. 16 N., R. 8 E., H. B. and M., for irrigation and domestic purposes. Estimated cost \$1,500. (251 acres.)

SUTTER COUNTY—Application 7085. Fred H. Heiken, as county treasurer of Sutter County and trustee of the Bond Fund of Reclamation District 1500, Robbins, for 6.35 c.f.s. from West Dredger Cut of Sutter By-Pass tributary to Sacramento River to be diverted in Sec. 11, T. 13 N., R. 2 E., M. D. B. and M., for irrigation purposes. (254.135 acres.) Estimated cost \$3,500.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of September, 1931.

SANTA CRUZ COUNTY—Permit 3775, Application 2897. C. H. Widemann, San Francisco, Sept. 4, 1931, for 1.78 c.f.s. from Scott Creek in Sec. 19, T. 10 S., R. 3 W., M. D. M., for irrigation and domestic purposes on 463 acres.

SANTA CRUZ COUNTY—Permit 3776, Application 2898. C. F. Widemann, San Francisco, Sept. 4, 1931, for 0.6 c.f.s. from Scott Creek in Sec. 9, T. 10 S., R. 3 W., M. D. M., for irrigation and domestic purposes on 75 acres.

SANTA CRUZ COUNTY—Permit 3777, Application 2899. C. H. Widemann, San Francisco, Sept. 4, 1931, for 2.69 c.f.s. from Scott Creek in Sec. 18, T. 10 S., R. 3 W., M. D. M., for irrigation and domestic purposes on 215 acres.

SANTA CRUZ COUNTY—Permit 3778, Application 2900. C. H. Widemann, San Francisco, Sept. 4, 1931, for 0.31 c.f.s. from Scott Creek in Sec. 18, T. 10 S., R. 3 W., M. D. M., for irrigation and domestic purposes on 25 acres.

NEVADA COUNTY—Permit 3779, Application 6862. John K. Williams, Nevada City, Sept. 1, 1931, for 1.0 c.f.s. from Windup Canyon in Sec. 5, T. 16 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$150.

TUOLUMNE COUNTY—Permit 3780, Application 6929. F. W. and Stella G. Ross, Stockton, Sept. 12, 1931, for 0.08 c.f.s. from four unnamed springs and an

Applications and Permits Granted

(Continued from preceding page)

unnamed stream in Sec. 35, T. 1 S., R. 16 E., M. D. M., for irrigation and domestic purposes on 15 acres. Estimated cost \$100.

TULARE COUNTY—Permit 3781, Application 6980. Frank O. Shelden, Porterville, Sept. 14, 1931, for 200 gallons per day from a spring in Sec. 35, T. 20 S., R. 31 E., M. D. M., for domestic use on Lot 9 of McIntyre Recreational Area, Sequoia National Forest. Estimated cost \$35.

SAN DIEGO COUNTY—Permit 3782, Application 6779. Talmadge Losce, Julian, Sept. 15, 1931, for 1.5 c.f.s. from 6 springs and wells in Secs. 7 and 18, T. 14 S., R. 7 E., S. B. M., for irrigation and domestic on 120 acres. Estimated cost \$6000.

KERN COUNTY—Permit 3783, Application 6973. Clinton E. Albertson, Inyokern, Sept. 18, 1931, for 500 gallons per day from a well in Sec. 26, T. 27 S., R. 40 E., M. D. M., for mining use in Sec. 22. Estimated cost \$200.

LAKE COUNTY—Permit 3784, Application 6904. C. G. Haycock, 2674 27th St., Sacramento, Sept. 18, 1931, for 0.5 c.f.s. from Middle Creek in Sec. 31, T. 16 N., R. 9 W., M. D. M., for irrigation of 40.46 acres in Sec. 31.

TRINITY COUNTY—Permit 3785, Application 6775. Louis A. Mair, Denny, Sept. 19, 1931, for 3 c.f.s. from an unnamed stream in Sec. 8, T. 6 N., R. 7 E., H. M., for mining and domestic purposes in Sec. 8. Estimated cost \$2,000.

VENTURA COUNTY—Permit 3786, Application 6909. Hibbard S. Williams, Santa Paula, Sept. 21, 1931, for 1 c.f.s. from an unnamed spring in Sec. 18, T. 4 N., R. 20 W., S. B. M., for mining and domestic purposes in Sec. 18. Estimated cost \$1,000.

KERN AND VENTURA COUNTIES—Permit 3787, Application 6939. Florence Louise Cuddy, Lebec, Sept. 21, 1931, for 100,000 gallons per day from 4 unnamed springs tributary to Cuddy Canyon, to San Joaquin Valley in Sec. 28, T. 9 N., R. 20 W.; Sec. 3, T. 8 N., R. 20 W., Sec. 10, T. 8 N., R. 20 W., S. B. M., for domestic and recreational purposes. Estimated cost \$3,000.

CONTRA COSTA COUNTY—Permit 3788, Application 6617. John Fleuti, Moraga, Sept. 22, 1931, for 5000 gallons per day from Grizzly Creek in Sec. 15, T. 1 S., R. 2 W., M. D. M., for domestic purposes for 33 homes in Sec. 10. Estimated cost \$1,000.

SONOMA COUNTY—Permit 3789, Application 7006. Hacienda Inc., Hilton, Sept. 22, 1931, for 0.347 c.f.s. from two unnamed streams and Russian River in Sec. 26, T. 8 N., R. 10 W., M. D. and M., for domestic and irrigation purposes on 19 acres in Sec. 26.

TULARE COUNTY—Permit 3790, Application 6951. N. N. Redford, A. M. Griggs, R. Y. Roper, Exeter, Sept. 26, 1931, for 600 gallons per day from Monarch Creek tributary to East Fork of Kaweah River in Sec. 15, T. 17 S., R. 31 E., M. D. M., for domestic purposes.

DEL NORTE COUNTY—Permit 3791, Application 6947. Frank Johnston, Crescent City, Sept. 26, 1931, for 2.00 c.f.s. from Spite Creek, tributary to Middle Fork of Smith River in Sec. 17, T. 17 N., R. 3 E., H. M., for mining and domestic purposes.

FRESNO COUNTY—Permit 3792, Application 7022. County of Fresno, Fresno, Sept. 28, 1931, for 0.111 c.f.s. from San Joaquin River in Sec. 32, T. 9 S., R. 23 E., M. D. M., for domestic purposes at sanatorium. Estimated cost \$14,000.

Highway Bids and Awards for September

SAN BENITO COUNTY—Between southerly boundary and Pajaro River, about 5.5 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. B, Hanrahan Company, San Francisco, \$295,310; Morrison-Knudsen Co., Boise, Idaho, \$291,755; Isbell Construction Co., Carson City, Nevada, \$339,219; Guy F. Atkinson Co., San Francisco, \$320,318; Frederickson & Watson Construction Co., and Fredrickson Bros., Oakland, \$322,687; Granite Construction Co., Ltd., Watsonville, \$295,202; Healy-Tibbitts Construction Co., San Francisco, \$290,332. Contract awarded to Peninsula Paving Co., San Francisco, \$264,964.

HUMBOLDT COUNTY—Between Redwood Creek and Willow Creek, about 8.9 miles to be surfaced with untreated crushed gravel or stone. Dist. I, Rt. 20, Sec. C, Smith Bros. Co., Eureka, \$54,922; Healy-Tibbitts Construction Co., San Francisco, \$55,947; California Construction Co., San Francisco, \$52,584; Hemstreet & Bell, Marysville, \$52,337; D. McDonald, Sacramento, \$55,665; A. Milne, Portland, Oregon, \$48,727; E. B. Bishop, Sacramento, \$48,324. Contract awarded to Triangle Rock & Gravel Co., San Bernardino, \$34,251.

ORANGE COUNTY—Between Fullerton and western boundary, about 4.3 miles to be graded with Portland cement concrete and asphaltic cement concrete. Dist. VII, Rt. 2, Sec. F, Griffith Co., Los Angeles, \$112,005; George R. Curtis Paving Co., Los Angeles, \$124,061; R. J. Bianco, Manhattan Beach, \$118,262; Steele Finley, Santa Ana, \$120,069; Hall-Johnson Co., Alhambra, \$132,806. Contract awarded to Oswald Bros., Los Angeles, \$111,494.

SAN JOAQUIN COUNTY—Between westerly boundary and a point near Banta, 8.8 miles asphalt concrete surface to be planed. Dist. X, Rt. 5, Sec. A, Monte C. Abrams, Los Angeles, \$11,018; Standard Road Planning

Co., Los Angeles, \$5,348. Contract awarded to Asphalt Pavement Planing Co., Oakland, \$4,331.

ARCHITECTURAL AWARDS

For Month of September

List of projects handled by the Division of Architecture for which contracts were awarded by Colonel Walter E. Garrison, Director of Public Works, during the month of September, 1931.

Sonoma State Home, Eldridge—Ward building and addition to school building; buildings to be one story, reinforced concrete, clay tile roof. Contract for general work to Wm. Spivock, San Francisco, \$74,333; for plumbing to J. A. Pazio, Oakland, \$6,166; for electrical to Decker Electrical Construction, San Francisco, \$2,704; for heating to Frederick W. Snook, San Francisco, \$8,640.

"Mary," said Mrs. Newrich to the new maid, "you may take the dog out and give him some air."

"Yes Ma'am," acquiesced Mary. "And please, Ma'am, where will I find the nearest service?"—"Wall Street Journal."

A slow-pay customer sent the following note to his garage mechanic: "Please send car; if O. K., will send check."

The mechanic, however, was not doing any business on such risky terms, so he wrote back: "Send check, if O. K., will send car."

"Give Family Man Job" Is Plea

Colonel Walter E. Garrison, director of the Department of Public Works is enlisting the cooperation of the contractors of the State in carrying out Governor Rolph's intensive program for speedily putting more

men to work on State projects, especially married men with families. Since the first of the month, with every award of a contract Colonel Garrison is sending the following personal letter to the successful bidder:

Gentlemen:

In awarding the enclosed contract to you, it is respectfully requested that you give serious consideration to an objective of the present administration in its endeavor to help in relief measures for the unemployed, especially the married man with a family.

The local community is very much interested in this contract, both from the standpoint of a necessary improvement and for the possible help it may afford its local citizens in obtaining work, thereby relieving them of possible charitable assistance and also as a means of forwarding local business. It is believed that local citizens could be effectively employed on this work, especially in the unskilled labor classification, and I am certain that by applying to the Board of Supervisors or local city officials they will be able to submit a number of worthy cases for your interview and consideration of their fitness for the work.

Your support in this direction would be very much appreciated by Governor Rolph and myself.

Yours very truly,
WALTER E. GARRISON,
 Director.

Maintenance Crew on Fire Line all Night

The effective work done by maintenance crews of the Division of Highways in preventing and extinguishing forest fires has been acknowledged from many different sources. Another instance is reported in the following letter:

Mr. Jno. H. Skeggs,
 District Engineer,
 San Francisco, Cal.

Dear Sir:

Replying to your letter of October 7th (File 404.19) relative to a forest fire near Big Basin.

A fire near the boundary of the park on the China Basin road was discovered on the afternoon of October 3d. Our maintenance crew foreman, R. H. Dickie, and three men responded to a call for

help, reporting at 5 p.m. and continuing through the night until 11 a.m. Sunday when they were relieved. They again reported at 10 a.m. on October 5th continuing until 2 p.m., at which time the blaze was under complete control.

The fire burned over an area of several acres and actually entered the park at its northeast boundary. I learned that the maintenance crew was among the first on the ground, and am informed by park officials and others that their prompt action in reporting for duty and their efforts through the night was largely responsible for bringing the fire under an early control.

Yours very truly,

J. W. ADAMS, Supt.

Host: It's beginning to rain; you'd better stop for dinner.

Motoring Visitor: Oh, thanks very much, but it's not bad enough for that.

Dedication of Russian River Bridge At Jenner Proves Gala Occasion

CLOSE to 10,000 enthusiasts, representing every one of the nine Redwood Empire counties attended the opening and formal dedication of the new Russian River bridge, on the Redwood Empire's Shoreline Highway, at Jenner, Sonoma County, Sunday, October 4th.

The affair, which was sponsored jointly by the Redwood Empire Association, officers and directors of the Shoreline Joint Highway District, the Coast Chamber of Commerce, the Shoreline Highway Association, Associated Chambers of Commerce of Sonoma County, and the various chambers of commerce of Marin, Mendocino, Humboldt, Del Norte, Napa, Lake and San Francisco counties, marked the passage of a new milestone in Redwood Empire highway affairs.

V. J. CANEPA OFFICIATES

Supervisor Victor J. Canepa, of San Francisco, president of the Shoreline Highway Bridge District, which constructed the magnificent new span with State aid by the Department of Public Works, acted as chairman of the day and the list of speakers included notables, not only of the Redwood Empire, but of the Federal, State, county and city governments, and of municipalities in other portions of northern California.

A feature of the day was the attendance at the celebration of T. M. Jenner of Seattle, grandson of the late Dr. E. K. Jenner who settled at the site of the community now known as Jenner in 1854, and from whom it took its name.

At the bridge dedication Governor James Rolph, Jr., was represented by Dr. J. M. Toner, director of the Department of Institutions of the State of California.

REARDON PRESENTS IT

The bridge was presented to the motoring public of California by State Highway Commissioner Timothy A. Reardon, of San Francisco, and was christened with a bottle of Sonoma County mineral water by Miss June Osborne of the Coast Chamber of Commerce.

Outstanding leaders who participated in the bridge dedication included: Edward Morris, president of the Redwood Empire Associa-

tion; Newton P. Howe, president of the Shoreline Highway Association; Harry G. Ridgway, vice president of the Redwood Empire Association and president of Marvelous Marin, Inc.; Supervisor Fred Suhr, of San Francisco, president of the Shoreline Intercounty Highway District; Supervisors C. J. Gardiner, Marin; Fred Lowell, Sonoma; Charles Perkins, Mendocino; and B. F. Flint, Humboldt, directors of the Shoreline Intercounty Highway District, and George Sanborn, the district's secretary.

THROW OF NOTABLES

Others present were Supervisor Ed Enzenauer, chairman, Board of Supervisors Sonoma County; J. B. Piatt, chief engineer of the district; T. C. McCoy, representing the division engineer; Dan Lafferty, president of the California State Automobile Association; M. F. Looseley, president of the Coast Chamber of Commerce; State Senators Herbert F. Slater, of Santa Rosa and Arthur M. Breed, of Alameda County; Assemblyman Hubert B. Scudder of Sonoma County; Supervisor William Deysher, of Marin County, chairman of the board and president of the Redwood Empire Supervisors Unit; E. L. Finley, president of the Newspaper Publishers' Unit of the Redwood Empire Association and Stanley H. Jones, president of the Chamber of Commerce Unit of the Redwood Empire Association.

At the conclusion of the speaking program and after Miss Shoreline Highway christened the bridge, a cardboard replica of the old original two-car ferry which served the traveling public for 60 odd years, was towed down the river, burned and blown up in spectacular manner, signifying the passing of the ferry and the opening of the new modern bridge.

Charles P. Nolan, who came to California in 1865, and assisted in furnishing the material for the first ferry at Markham, which this bridge supplanted, was introduced from the speakers' stand. Mr. Nolan is one of the last of the old-time settlers of Sonoma County.

"Have you a skeleton in your closet?"
"No, it's out in the garage. I forgot to lock the doors last night and somebody took everything except two wheels and the frame."



THREE ROUSING CHEERS went up as the beautiful new bridge at the mouth of the Russian River near Jenner was dedicated and thrown open to traffic on Sunday, October 4th, ending another bottleneck on the Redwood Empire's Shoreline Highway. For sixty years a dinky ferryboat of two-car capacity has been the only means of crossing the river at that point. The new bridge as shown in the upper picture is a graceful span of steel and concrete. A portion of the large crowd numbering ten thousand or more that attended the dedication ceremonies is shown in the center while below is Supervisor Victor Canepa of San Francisco, president of Shoreline Joint Highway District No. 16, and Miss June Osborne of the Coast Chamber of Commerce, who christened the bridge with a bottle of Sonoma County mineral water. A pasteboard replica of the old ferryboat was towed out into the river, blown up and burned as the dedication ceremony ended.



New Plan Relieves Courts in Minor Light Violations

Motorists stopped on the highways hereafter by officers for minor violations of the headlight laws will be relieved from appearing in court, provided they have the proper adjustments made.

The arrangement, designed to relieve the court so that more time may be given to really serious violations of the motor laws, will be made possible by the issuance of "warning cards" to the offending motorist upon which the light adjustment required is noted.

Check Up Provided

These cards inform the motorist that he must have the adjustment made within a given number of days at an official headlight station. After the adjustment is made the authorized adjuster signs the card and it is mailed to the squad headquarters of the patrol from which the arresting officer is working.

If the card is not received within a reasonable length of time, the officer swears to a complaint and arrests the motorist. He then will be required not only to have the adjustment made to his lights, but to appear in court and, possibly, to pay a fine.

A careful "follow up" check of each case will be made by means of information taken down on a stub of the officer's book when the motorist is cited.

Relieves the Courts

Inspector Will R. Sharkey, Jr., head of the Bureau of Lights of the California Highway Patrol, who worked out the system, said it would have the effect of ridding the highways of defective, illegal and glaring lights without congesting the courts with such cases.

On light raids conducted by the patrol as many as 200 persons have been cited in a single evening by one squad, Sharkey explained. To throw this number of cases into a justice's court at one time means congestion and confusion.

"Besides it is poor practice to require a motorist to appear in court for a minor light violation which may have been caused through accident or inadvertence when the result sought can be accomplished by having the trouble attended to," Sharkey added.

"I want a very careful chauffeur—one who doesn't take the slightest risks," warned the would-be employer. "I'm your man, sir," answered the applicant. "Can I have my salary in advance?"—*Brooklyn Eagle.*

The Engineer

WHO is the man designs our pumps with judgment, skill and care?

Who is the man that builds 'em and keeps them in repair?

Who has to shut them down because the valve seats disappear

The bearing-wearing, gearing-tearing mechanical engineer.

WHO buys his juice for half a cent and wants to charge a dime?

Who, when we've signed the contract, can't deliver half the time?

Who thinks the loss of twenty-six per cent is nothing queer?

The volt-inducing, load-reducing electrical engineer.

WHO takes a transit out to find a sewer line to tap?

Who then with care extreme locates the junction on the map?

Who is it goes to dig it up and finds it nowhere near?

The mud-bespattered, torn and tattered civil engineer.

WHO thinks without his product we should all be in a lurch?

Who has a heathen idol which he designates research?

Who tints the creeks, perfumes the air, and makes the landscape drear?

The stink-evolving, grease-dissolving chemical engineer.

WHO is the man that will draw a plan for everything you desire

From a transatlantic liner to a hairpin made of wire,

With "ifs" and "ands," "howevers" and "buts" who makes his meaning clear?

The work-disdaining, fee-retaining consulting engineer.

WHO builds the road for fifty years that disappears in two,

Then changes his identity, so no one's left to sue?

Who covers all the traveled roads with filthy, oily smear?

The bump-providing, rough-on-riding highway engineer.

WHO takes the pleasure out of life and makes existence hell?

Who'll fire a real good-looking one because she can not spell?

Who substitutes a dictaphone for a coral tinted ear?

The penny-chasing, dollar-wasting efficiency engineer.

—Author unknown.

Printed in Professional Engineer, Courtesy
Purdue Engineer.

! ! ! *What Ho, The Fox* ! ! !



Thrill of the Chase at Bidders' Matinee

One of the colorful events of the week in the routine of the Department of Public Works is the bidders' matinee held every Wednesday in the large board room on the third floor.

Two o'clock is the hour set for the important business of opening bids submitted on proposed work. Long before the hour, however, the room is filled with some seventy or more contractors, material men, bond company agents and others interested in the results of the bidding contest. They sit there chatting, chaffing, smoking, apparently a care-free bunch but each one is secretly wondering if there's a "fox" in their midst.

At the department executives' table sits G. T. McCoy, principal assistant engineer, flanked by J. G. Standley, staff engineer; William Boch, assistant office engineer, and George T. Gunston, assistant secretary of the Highway Division and disbursing officer.

HUNT IS ON

When Mr. McCoy announces the bids are about to be opened, a deep silence suddenly pervades the room. Mr. Gunston takes a



THEY'RE "FOX HUNTING," these contractors, material dealers and others are eager for the chase. The scene is the regular afternoon meeting at the opening of awards in the Department of Public Works. The department executives in the lower picture who officiate on such occasions are (left to right) G. T. Gunston, assistant secretary and disbursing officer, Highway Division; J. G. Standley, staff engineer; G. T. McCoy, principal assistant engineer, and William Boch, assistant office engineer.

large sealed envelope from a pile in front of him containing the bids, opens it, extracts the bid, and a fat cashier's or certified check representing a liberal ten per cent of the bidder's

(Continued on page 44)

River Bank Protection Completed

(Continued from page 31)

ath River in Siskiyou County. It will be a concrete arch 165 feet in height with a storage capacity of 59,000 acre-feet, to cost approximately \$1,500,000. This dam will be part of the California-Oregon Power Company's system and there will be a power house in connection with the dam.

Applications for Approval of Plans for Repairs or Alterations.

Dam	Owner	County
Buckhorn	James L. Humphrey	Lassen
Buckhorn Lake	Pacific Gas and Electric Co.	Shasta
Lake Madigan	City of Vallejo	Solano
Lake Camille	Napa State Hospital	Napa
Fire Dam	Napa State Hospital	Napa
Napa Middle Reservoir	Napa State Hospital	Napa
Napa Upper Reservoir	Napa State Hospital	Napa
Martin	Hutchison et al	Sacramento
San Vincente Creek	Coast Dairies and Land Co.	Santa Cruz
Lake Chabot	Vallejo Water Company	Solano

Plans Approved for Construction.

Dam	Owner	County
Verdugo Wash	L. A. Co. Flood Control Dist.	Los Angeles

Plans Approved for Repairs or Alterations.

Dam	Owner	County
Florence Lake	Southern California Edison Co.	Fresno
Diversion	North Fork Ditch Company	Placer and Sacramento
Kincaid	Pacific Gas and Electric Co.	Tuolumne
Buckhorn	James L. Humphrey	Lassen
Buckhorn Lake	Pacific Gas and Electric Co.	Shasta
Martin	Hutchison et al	Sacramento

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project.

Routine maintenance work has been continued, including repairs to structures and irrigation of willows planted for bank protection. Repairs on several bridges have been commenced.

A small crew under the river foreman has been engaged in clearing and stumping a ten-acre tract in the Sacramento By-Pass.

BANK PROTECTION

Advice has been received from the California Debris Commission of the decision of the chief of engineers relative to the extent of bank protection to be undertaken by the Federal Government under existing law. That decision is expressed as follows: " * * * The Engineer Department will not without specific legislative authorization undertake the revetment of the banks of the Sacramento and its tributaries except for the protection of the weirs forming a part of the flood control project."

The result of this decision will be that, without further action by Congress, the Federal Government will do no bank protection work in the Sacramento or its tributaries above the mouth of Cache Slough. Necessary bank protection work must therefore be undertaken by the State in cooperation with local districts, with funds provided for flood control project maintenance.

During the past year the California Debris Commission has completed bank protection work on the Sacramento River between the mouth of Cache Slough and Sacramento costing approximately \$84,000. Continuation of this work has been stopped by the decision of the chief of engineers. As this change of policy has only been recently announced, no work has yet been set up under the new arrangement.

The construction of 229 feet of railroad trestle to extend the jetty being done under contract by the Healy Tibbets Construction Company, has been practically completed. Repairs to the shovel in the quarry and the railroad have been completed and the placing of rock in the jetty will commence at once.

WATER RIGHTS

Applications to Appropriate.

During the month of August 42 applications were received for the appropriation of water, 20 applications were denied and 15 were approved; three permits were revoked and one license was issued.

Adjudications.

Whitewater River (San Bernardino and Riverside counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). A hearing on the exceptions to the division's report as referee has been set by the Superior Court for October 5, 1931.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Los Alamos Creek (Santa Barbara County). Division's report as referee has been submitted to the Superior Court and a decree is expected in the near future.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). All but one of the water users have signed a stipulation for consent judgment.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek was continued throughout the month in accordance with the trial schedule of allotments which was adopted for the 1931 season.

Franklin Creek (Modoc County). Administration of the schedule of allotments for trial distribution during the 1931 irrigation season was continued throughout the month.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

During the past month the regular field work has continued, comprising measurements of all diversions, stream flow, and return water throughout the Sacramento-San Joaquin territory.

Flow of Sacramento Stream Increased

(Continued from preceding page)

Since the first of September, irrigation diversions have rapidly decreased and due to this and the drainage of the rice fields, the flow of the Sacramento River at Sacramento was increased to better than 2000 second-feet on September 10. No new salinity stations have been required but all regular stations, about sixty in number, have been maintained. In addition, many special samples have been taken at the request of various delta water users. The regular salinity bulletins have been sent out at about four-day intervals until recently. With the increasing river flow and reduction in irrigation draft, the interval between bulletins has been increased. Due to the increased flow at Sacramento, the salinity in the Upper Sacramento Delta has rapidly decreased but it has continued to increase at practically all of the San Joaquin Delta stations. There has been practically no increase in the flow to the delta of the San Joaquin River.

The special investigation has continued in the delta and up-river areas to determine the facts needed to establish the damage resulting from the present season's water shortage.

The accompanying tabulations of river discharge and salinity show a comparison between the measurements in August and September of this season and the records in September, 1924.

RIVER DISCHARGE

Station	Discharge in Second-feet		
	1931	1924	
	August	September	September
Sacramento River at Red Bluff.....	8/10—2600	9/10—2750	9/10—2390
Sacramento River at Butte City.....	8/11—1130	9/9—1790	9/8—2160
Sacramento River at Colusa.....	8/11—992	9/8—1620	9/8—2170
Sacramento River at Knights Landing.....	8/10—597	9/8—1440	9/8—2040
Sacramento River at Verona.....	8/12—798	9/10—2260	9/10—1035
Sacramento River at Sacramento.....	8/12—550	9/10—2270	9/10—2180
Feather River at Nicolaus.....	8/12—46	9/9—333	9/8—42
American River at H Street Bridge.....	8/13—38	9/10—103	9/10—31
San Joaquin River near Vernalis.....	8/10—260	9/11—271	9/11—416
Combined flow of Sacramento River at Sacramento and San Joaquin River near Vernalis.....	8/12—810	9/10—2540	9/10—2596

CALIFORNIA COOPERATIVE SNOW SURVEYS

Office work during the past month has included routine compilations, the preparation of sketch maps for snow courses in the Walker, South Kings and South American River basins.

In the field, a six-day reconnaissance trip was made in the South Kings River Basin and new snow survey courses were established at Copper Creek Summit, elevation 10,200 between the south and middle forks; Junction Meadows, elevation 8500 on Bubbs Creek; and Bullfrog Lake, elevation 10,700 two miles west of Kearsarge Pass. Negotiations are in progress for cooperation with the Forest Service for the construction of necessary shelter cabins and the survey of the new route to include these courses.

Jeff Davis Peak shelter cabin in the Mokelumne River Basin was completed during the month and accepted.

The snow course at Lake Lucille in the American River Basin was inspected, brushed out, resigned and sketched.

FEDERAL COOPERATION—STREAM GAGING

In connection with the Federal-State cooperation for stream gaging, a trip was made to the Lake Bowman area and agreement was reached between the State, the U. S. Geological Survey and the Nevada Irrigation District as to certain construction work needed at the Milton-Bowman outlet station and as to the future maintenance of the four stations in the Bowman area.

VENTURA COUNTY INVESTIGATION

Drilling of the Devil Canyon dam site was completed and the showing as to foundation is not satisfactory although it is not to be inferred that the site is condemned. Drilling was started with a Calyx drill at the Blue Gulch site and the driller is still in the wash gravel of the river bed. Drilling the Spring Creek site is progressing with a Diamond drill and core is quite satisfactory. Two holes have been put down and a third has been started. Other work on underground water in Ventura County investigation has proceeded in a routine way.

South Coastal Basin Investigation.

Work of determining capacity of underground basins and working up old records of rainfall and water table fluctuation is progressing satisfactorily.

SALINITY-SACRAMENTO-SAN JOAQUIN DELTA

	8/10/31	9/10/31	9/10/24
	Parts of Chlorine per 100,000		
O and A Ferry.....	1320	1360	1235
Collinsville.....	1190	1180	1035
Emmattson.....	900	860	696
Three Mile Slough Bridge.....	760	840	566
Rio Vista Bridge.....	770	640	402
Isleton.....	510	440	30
Howard Ferry.....	400	27	10
Walnut Grove.....	200	10	8
Hood Ferry.....	8	7	8
Antioch.....	1050	1100	1065
Jersey.....	700	800	604
Webb Pump.....	520	620	326
Central Landing.....	370	250	164
Middle River P. O.....	130	250	142
Clifton Court Ferry.....	56	100	60
Williams Bridge.....	52	80	---

The water master service on the Feather River was continued through the first ten days of September. At the end of that time the irrigation demands had greatly diminished and the stream flow had increased

Plans Approved in September for Dam Changes or Repairs

(Continued from page 34)

of 10.8 acre-feet, situated on unnamed creek, tributary to Sweetwater River in Sec. 31, T. 16 S., R. 1 E., S. B. B. and M., for storage purposes, for domestic and irrigation use.

SUTTER COUNTY—Wadsworth Dam No. 1-15. Sacramento and San Joaquin Drainage District, Sacramento, owner; flashboard, 173 feet above streambed with a storage capacity of 162 acre-feet, situated on Wadsworth Canal, tributary to Sacramento River in Sec. 15, T. 15 N., R. 2 E., M. D. B. and M., for storage purposes, for underground use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of September, 1931.

LASSEN COUNTY—Buckhorn Dam No. 238. James L. Humphrey, Reno, owner; earth dam, situated on Painter Creek in Sec. 31, T. 36 N., R. 17 E., M. D. B. and M.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86. Pacific Gas and Electric Company, San Francisco, owner; earth, located in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M.

SACRAMENTO COUNTY—Martin Dam No. 451. Hutchison et al, Slough House, owner; gravity, situated on Cosumnes River tributary to San Joaquin River in Sec. 35, T. 8 N., R. 8 E., M. D. B. and M.

NAPA COUNTY—Lake Camille Dam No. 1-5. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Fire Dam No. 1-7. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Napa Middle Reservoir No. 1-8. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek and Napa River in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

NAPA COUNTY—Napa Upper Reservoir No. 1-9. Napa State Hospital, Imola, owner; earth, situated on unnamed creek tributary to Tulocay Creek in Napa Reservoir, located in Sec. 13, T. 5 N., R. 4 W., M. D. B. and M.

SOLANO COUNTY—Lake Madigan Dam No. 14-2. City of Vallejo, Vallejo, owner; earth, situated on Wild Horse Creek tributary to Green Valley Creek in Sec. 9, T. 5 N., R. 3 W., M. D. B. and M.

LASSEN COUNTY—Long Canyon Dam No. 244. John M. Hagata, Susanville, owner; earth fill, situated on Long Canyon in Sec. 7, T. 31 N., R. 13 E., M. D. B. and M.

SANTA CRUZ COUNTY—San Vicente Creek Dam No. 632-2. Coast Dairies and Land Company, Davenport, owner; gravity, situated on San Vicente Creek in Ranchos San Vicente and Arroyo de la Laguna.

MONTEREY COUNTY—Black Rock Dam No. 643. Monterey Stock and Game Association, Monterey, owner; earth, situated on Black Rock Creek tributary to Carmel River in Sec. 32, T. 17 S., R. 2 E., M. D. B. and M.

SOLANO COUNTY—Lake Chabot Dam No. 441. Vallejo Water Company, Oakland, owner; earth, situated on Blue Rock Spring, tributary to Sulphur Springs, 3 mile north of Vallejo.

NEVADA COUNTY—Pontoon Dam No. 61-15. Nevada Irrigation District, Grass Valley, owner; timber, 21 feet above streambed with a storage capacity of 140 + acre-feet, situated on Canyon Creek tributary to South Yuba River in Sec. 13, T. 18 N., R. 12 E., M. D. B. and M.

EL DORADO COUNTY—Fallen Leaf Lake Dam No. 461. Anita M. Baldwin, Los Angeles, owner; concrete, situated on Taylor Creek tributary to Lake Tahoe in Sec. 1, T. 12 N., R. 17 E., M. D. B. and M.

MODOC COUNTY—Courtwright Dam No. 155. R. Anchordoguy, Red Bluff, owner; earth dam, situated on Happy Camp Creek in Sec. 22, T. 42 N., R. 7 E., M. D. B. and M.

THE HIGHWAY

There's a long gray ribbon, with straight
white lines,

Which the Master Merchant unfurled
For pity of crowds and town-sick folk
With hands that tired and hearts that broke;
And it reaches the end of the world!

So He stands and smiles, that Mighty Man,
Unfurling His ribbon rolls;
And the ribbon coils go up and down
Through blossomy fields and village and town
For rest of our weary souls.

The red says "Stop!" but green says "Go!"
And the hills and fields are green;
So let's away, my lad! my lass!
The trees all beckon, and the young, young
grass
Calls "What a long time you have been!"

—Eleanor Preston Watkins.

Printed in the Women's City Club Magazine

"What Ho, the Fox" At Bidders' Matinee

(Continued from page 41)

figure. He announces the title of the job, the name of the bidder and the size of the check and passes the sheet to Mr. Standley who reads aloud the item prices and total figure of the bid.

The reading is followed with rapt attention while busy pencils jot down item prices and totals on blank forms for comparison with their own bids.

So the silent quest for the "fox" goes on till the last bid is read and the lowest bidder revealed. He is the man who has outfoxed them all in coralling the contract.

FOX IN THE OPEN

Instantly the silence is broken by a loud buzz of conversation and bustling about as rival bidders argue and bond house agents and material men besiege the "fox" for business.

Some rivals congratulate him, others commiserate with him declaring he'll "lose his socks" on the job. Thus the "fox" is caught in the open and the hunt is over.

With 150 to 200 going contracts constantly being accepted and new ones awarded, this scene is repeated at the California Department of Public Works nearly every week in the year with possibly one or two exceptions.

"Can I help you start that car? I know a lot about that make."

"Well, whisper it. There are ladies present."

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

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CALIFORNIA HIGHWAY COMMISSION

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L. V. CAMPBELL, Office Engineer

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FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

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R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Comptroller

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H. S. COMLY, District II, Redding

CHARLES H. WHITMORE, District III, Sacramento

J. H. SKEGGS, District IV, San Francisco

L. H. GIBSON, District V, San Luis Obispo

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S. V. CORTELYOU, District VII, Los Angeles

E. Q. SULLIVAN, District VIII, San Bernardino

F. G. SOMNER, District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,
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HAROLD CONKLING, Deputy in Charge Water Rights

A. D. EDMONSTON, Deputy in Charge Water
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Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams

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C. C. CARLETON, Chief

FRANK B. DURKEE, General Right of Way Agent

C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

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\$66,000,000 *To Workers for Improvements*

The Department of Public Works in 1931 Has Set \$48,000,000 of This Amount in Motion Against the Unemployment Situation and \$18,000,000 Through the Counties

By JAMES I. HERZ, Deputy Director of Public Works

AN ORDERLY program of public improvements, advanced on schedule and expanded to the maximum of budget allowances, represents the California state administration's contact with the unemployment problem.

The situation, now growing in tenseness, was anticipated last January when Governor Rolph asked the Legislature to pass building appropriations as emergency measures and make the money immediately available for use.

Outstanding and independent of any figures hereafter mentioned, the San Francisco Bay Bridge, a \$75,000,000 project, was launched, given its preliminary financing, and is being now advanced to the stage of construction.

ALL WORK ADVANCED

The schedule for teachers colleges, hospitals, office buildings, armories and relief homes was advanced by a full year.

The \$48,000,000 program of the Department of Public Works was set in motion without delay. Every form of expenditure and construction was understood to have the creation of employment as a major objective. Today, \$46,000,000 of \$48,000,000 total has been expended or is accruing under contracts.

On the Division of Highways fell the principal responsibility for the expenditures of the millions and the employment of the tens of thousands of men. Facing the biennium

with an income of \$64,118,943.28, the Division was able to plan wisely, and the mobility of its funds enabled it to proceed without delay.

Equally important was the share of gas tax money falling by law to the several counties of the State. For the last biennium, this total was \$31,844,342.42. The money is apportioned to the counties on the basis of automobile registrations. It becomes the backbone of their local highway construction and maintenance.

NOT COOPERATIVE

It is not involved in cooperative highway districts or in such allocations as the Highway Division may make directly in aid of such projects as, for instance, the so-called "bottle neck" problem of San Francisco, relating to the congestion of traffic in the Colma-Daly City district. The State contributed \$200,000 to this enterprise, which, when matched by the local appropriation, makes a \$500,000 item to apply against the employment problem in that vicinity. Following the lead of the State, San Francisco voted \$2,000,000 bonds for relief work.

Los Angeles came forward in fine spirit with \$5,000,000 for emergency work as against the unemployment situation. The example and actual encouragement given to the several communities by the State, appears to have encouraged them to face the situation with practical relief measures.



James I. Herz

Beautiful Trees of Cherokee Lane Spared in Careful Paving Operations

By R. E. PIERCE, District Engineer

THE RECENT completion of grading and paving on Cherokee Lane, a portion of the Golden State Highway in San Joaquin County, north of Stockton, has demonstrated what can be done toward preserving existing trees and still not interfering with our standards of road section and drainage.

The greater portion of the 14 miles of the Cherokee Lane which is on the State highway system is lined with trees, some having been planted many years ago for shade purposes, others being a portion of the natural oaks which originally covered large areas of San Joaquin County, and others being orchard trees planted and maintained by the abutting property owners.

Before starting construction, a detailed field study of line and grade adjustments was made so as to preserve as many of the trees as possible.

"TURNPIKE" SECTION

The road cross-section is the so-called "turnpike" section, which makes use of practically the full width of the 100-foot right of way, by placing shallow draining ditches a foot inside the right of way and then carrying a flat slope from the shoulder edge to the bottom of the ditch.

Practically all the trees which came between the shoulder line, which is eight feet from the edge of the pavement, and the ditch were preserved, except some of the orchard trees which were in many cases planted so closely together that it was impracticable to work around them, and these were thinned out, making room for grading equipment and still not impairing the general effect.

Adjoining the east city limits of Lodi, a 76-foot width of pavement was built as a cooperative project in which city, county and State participated and here all the widening was done on the easterly side of Cherokee Lane to avoid disturbing the more highly developed property on the west. This made necessary the removal of most of the trees on the east side of the road. Also, north of Lodi, there was planted under permit from the State in

1921 a row of oriental plane trees on each side of the road for about one mile to the Mokelumne River. These were so close to the road that it was decided to adjust the center line of pavement to leave one row intact, the westerly row being eliminated.

In these two places it is planned to replace the trees removed by new trees to be planted by the State this fall in the proper position.

SAVED FRONT YARDS

A number of the residences along Cherokee Lane have nicely landscaped front yards with shrubs and lawn. All of these were left practically in their original condition by carrying the side drainage through a metal culvert under the yard.

In general, grades were adjusted so that the trees were not disturbed by filling or cutting around the roots. In cases where the slope came too low, a mound was filled around the base of the tree to protect it.

A considerable number of the trees which were left, while in the clear of the two-lane pavement (20 feet wide), will necessarily have to be removed when pavement is widened. It is the intention to plant new trees back of the trees which must eventually be removed so that when the time comes for taking them out, the new trees will have several years' growth, thus eliminating some of the objection to removal of the existing trees.

IN THREE CONTRACTS

The paving on Cherokee Lane was handled by three separate contracts, and the bridges under two contracts.

The joint paving project adjoining Lodi is the first 76-foot width Portland cement concrete pavement on the State highway in northern California. The State had already built a 20-foot pavement through this stretch before the district contract was started. The State contributed to the district the cost of two additional 10-foot lanes through this stretch, making their total participation on the basis of a 40-foot width.

In so far as we can learn, a State record was made on speed of paving the 5.55-mile section along Cherokee Lane.



"CONTRACTOR SPARE THAT TREE" was, in effect, the general order promulgated by the engineers of the Department of Public Works in planning the regrading and paving of fourteen miles of the Cherokee Lane section of the Golden State highway north of Stockton. Care was taken to preserve as far as possible all the arboreal beauty of the roadsides. Picture No. 1 shows how the draining ditch was carried in a pipe under a front yard to preserve lawn and trees. No. 2 shows oak trees saved near Live Oak. In No. 3, where the grading came too low, the trees are seen protected by mounds filled around their bases. No. 4 shows trees preserved near Houston school.

Governor Rolph Completes Visits to 58 County Seats, Keeping His Promise

PRECEDENT established; records broken!

Fifty-eight county seats of the fifty-eight counties of the State of California have now been visited by Governor James Rolph, Jr., an achievement never before accomplished by any Governor of this State!

Wednesday, November 18th, marked the establishment of this remarkable record of "Sunny Jim," accomplished just ten months after his inauguration.

On the last lap of this swing throughout the State which has taken him into every corner, every hamlet, every town and city of the great commonwealth of California, the Governor, accompanied by a number of his official family, visited Crescent City, Eureka, Ukiah, and Lakeport, on November 16, 17 and 18.

KEPT CAMPAIGN PROMISE

During the primary campaign, the Governor stumped the State from north to south, from east to west. He told his fellow Californians then that, if elected to the lofty office of Chief Executive of the State, he would again visit every community and particularly every county seat. He said the purpose of such visits would be, first, to thank the voters for their faith and confidence in him, and second, to learn first hand the problems faced by each community.

To keep his promise, he arose from a sick bed. For, just a few days before the scheduled last lap of the state-wide tour, his physician was doubtful if the Governor's health would permit the strain of such a journey. But the Governor was adamant. He insisted he must keep his engagements in Del Norte, Mendocino, and Lake counties. And despite cold, rain and sleet, through which he traveled the entire three days of this last lap, the Governor set out.

SPLENDID RECEPTIONS

His receptions everywhere throughout each town, have been extraordinary demonstrations of popular enthusiasm and appreciation. But those accorded him on this last trip, transcended any previous ones. For the people he visited realized that the Governor was taxing himself to keep his word. And their

response was more than generous. Everywhere he visited, hundreds turned out to greet him. At several of the luncheons and banquets given in his honor, scores were turned away for lack of accommodations, despite the fact that his audiences were forced to travel over wet and slippery roads to greet him.

Many sections of the State visited had never seen a Governor. Hundreds of little one-room school houses have been inspected and the children, sons and daughters of farmers, agriculturists, cattle raisers, and miners, have been addressed by the State's Chief Executive.

And his message to these little ones?

Their obligations to their parents and their teachers.

MESSAGE TO CHILDREN

He told them that California was second to no State in the generous and thorough education being given its young. He admonished them to shun evil companions and to grow up useful citizens. He told them they were living in a matchless age and urged them to take advantage of the opportunities offered them.

To his adult audiences, the Governor took this message:

"Have faith in California."

He outlined the possibilities of the State; he begged for support of an equitable State-wide water plan to the end that all sections of the State might be opened up for the huge population he predicted would come to California if given an adequate water supply.

He told of the efforts of the administration to cope with the unemployment situation and begged that support be given by all citizens to all relief and charity organizations.

He pictured the faith being shown in California by the big shipping interests who today are building a series of huge liners to ply along the pathways of trade and commerce from the ports of this State.

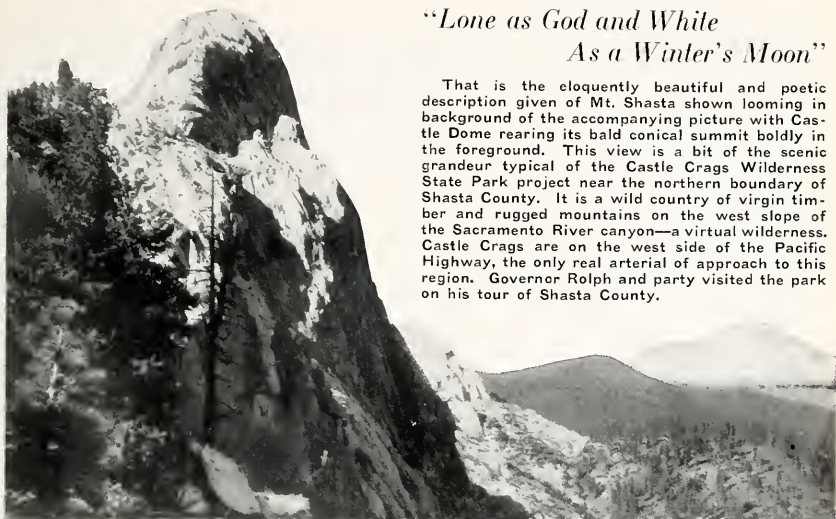
Accompanying the Governor on these trips, have been prominent members of his official family, to discuss with the citizens of various communities the problems relative to each section of the State.

Enthusiastic applause greeted the Governor's speeches, particularly when he said:

(Continued on page 44)

"Lone as God and White As a Winter's Moon"

That is the eloquently beautiful and poetic description given of Mt. Shasta shown looming in background of the accompanying picture with Castle Dome rearing its bald conical summit boldly in the foreground. This view is a bit of the scenic grandeur typical of the Castle Crags Wilderness State Park project near the northern boundary of Shasta County. It is a wild country of virgin timber and rugged mountains on the west slope of the Sacramento River canyon—a virtual wilderness. Castle Crags are on the west side of the Pacific Highway, the only real arterial of approach to this region. Governor Rolph and party visited the park on his tour of Shasta County.



NO HOLLYWOOD STUFF in this picture. It's real scenery as viewed from the Pacific Highway near Castella Portal of the Castle Crags Wilderness State Park project and the picture was taken during Governor Rolph's recent visit to Shasta County. The Governor and his party were standing on the Pacific Highway bridge over Castle Creek. In the party, from left to right, are Russell Bevans, Eric Cullenward, John McColl, Henry J. McGuiness, Earl Lee Kelly, E. Raymond Cato, Governor James Rolph, Jr., Charles H. Purcell and Colonel Walter E. Garrison.

Western State Engineers, Meeting in Sacramento, Pass Important Resolutions

THE Association of Western State Engineers, meeting at the State Capitol in Sacramento with Edward Hyatt, State Engineer of California, presiding, concluded its Fourth Annual Conference on October 30th. It was a meeting featured by record attendance, excellent papers, and lively discussion. Attention, as was to be expected, focused upon water matters and Federal-State relations with respect thereto.

Arizona, California, Colorado, Idaho, Kansas, Nevada, New Mexico, North Dakota, Oregon, Texas, Utah, Washington, Wyoming, the U. S. Geological Survey, the Division of Agricultural Engineering of the U. S. Department of Agriculture, the U. S. Bureau of Reclamation, the U. S. Forest Service, the U. S. Corps of Army Engineers, and the Federal Power Commission were represented officially by one or more delegates and there was a large attendance of visitors throughout each day of the conference.

RESOLUTIONS ADOPTED

The most important business transacted at the conference was the adoption of resolutions which are briefly summarized as follows:

RESOLUTION NO. 1 recommending changes in connection with the United States Weather Bureau with respect to more careful location of precipitation stations, a more accurate check of records prior to publication, an increase in research work, and the employment of more scientific personnel.

RESOLUTION NO. 2 reaffirming the previously announced position of the Association condemning efforts of Federal Bureaus to assert Federal ownership of unappropriated water and to avoid compliance with State laws and decisions of the courts with respect thereto.

RESOLUTION NO. 3 inviting Dr. Elwood Mead, U. S. Commissioner of Reclamation, to attend the next conference of the Association prepared to outline definitely the policy of the Bureau of Reclamation with respect to acquirement, adjudication, and administration of water rights of the bureau.

RESOLUTION NO. 4 requesting the Secretary of the Interior to name a "Director" in place of an "Acting Director" of the U. S. Geological Survey.

CALL FOR RESURVEY

RESOLUTION NO. 5 calling for a resurvey and readjustment of the U. S. Army gaging stations established pursuant to the provisions of House Document 308, 69th Congress, 1st Session; dis-

proving the provision in the appropriation bill of the current year requiring cooperating agencies to pay half the cost of publication of data; urging that henceforth Congress appropriate sufficient moneys to the Geological Survey that it can carry on all required Federal stream gaging and topographic mapping instead of parcelling this work out among various interested Federal agencies, and urging upon Congress that it appropriate sufficient moneys to the Geological Survey to complete a satisfactory base map of the United States in twenty years and that in this work the Survey be authorized to meet offers of cooperation on a fifty-fifty basis subject only to the condition that a reasonable proportion of the whole appropriation be divided equitably among all states having due regard to the unsurveyed areas in each and the importance of the work.

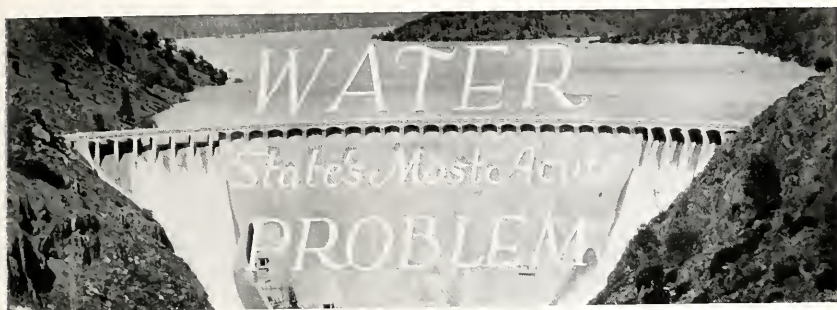
RESOLUTION NO. 6 endorsing the principle expressed in Senate Bill 4123 and H. R. 11718 proposing Federal relief for drainage and irrigation districts, and

RESOLUTION NO. 7 commending the President of the United States and the Congress for their efforts to reach a proper solution of the important question of disposal of public lands and urging upon them the most serious consideration of the report of the Committee on Conservation and Administration of the Public Domain.

OTHER TOPICS DISCUSSED

Members were greeted on the opening day by Lieutenant Governor Frank F. Merriam and Mayor C. H. S. Bidwell of Sacramento and Congressman Phil D. Swing dropped in during the course of the conference to pledge his support to the Association. Discussion of Federal and State policies with respect to water, occupied the attention of the conference.

George M. Bacon, State Engineer of Utah, was elected president succeeding Edward Hyatt, State Engineer of California, and Salt Lake City was selected as the next place of meeting. George S. Knapp, Chief Engineer of the Division of Water Resources of Kansas, was elected vice president succeeding Mr. Bacon, and Mr. Reid Jerman, Principal Assistant State Engineer of Utah, has been named Secretary to succeed Everett N. Bryan, Hydraulic Engineer of the California Division of Water Resources. Edward Hyatt, State Engineer of California, was elected to serve with the president and vice president as third member of the executive committee.



This is the fourth of a series of articles on the State's water problem to be published in *California Highways and Public Works*. The first dealt with Governor Rolph's call for united efforts by the entire State to solve the problem. The second and third articles described the situation confronting the Sacramento Valley, Sacramento-San Joaquin Delta and Los Angeles areas. This article is devoted to San Joaquin Valley conditions and the State water plan for improving them.

THE San Joaquin Valley, commencing at the junction of San Joaquin and Sacramento Rivers, sweeps southward between the Sierra Nevada and Coast Range, a distance of 250 miles to the horseshoe rim of the Tehachapi Mountains at the head of the valley. From 50 to 70 miles in width, the valley is an empire in itself, containing more than one-third of the agricultural lands of the State.

Favorable climatic conditions and fertile soils led to intensive development of many large areas of the valley. Scant rainfall forced the use of irrigation and more than one-third of the lands now under irrigation within the State are in this great valley. As the rainfall and water supply in the Coast Range are small, most of the irrigation development is on the east side, or adjacent to the San Joaquin River on the west side.

Irrigation development has taken a somewhat different course in the northern and southern parts of the valley. In the section northerly from the Chowchilla River near Madera direct diversions from the Sierra streams were used for irrigation until development had become sufficiently extensive to enable storage to be financed.

THREE RESERVOIRS

Reservoirs on three of the large east side tributaries have been constructed to sufficient capacity to insure a dependable water supply throughout the season for the present development. These reservoirs are the Melones Reser-

voir on the Stanislaus River with a capacity of 113,000 acre-feet, serving the Oakdale Irrigation District with a net irrigated area of 21,000 acres and the South San Joaquin Irrigation District with a net irrigated area of 54,300 acres; the Don Pedro Reservoir with a capacity of 290,000 acre-feet serving a net irrigated area of 205,000 acres in the Modesto and Turlock Irrigation Districts; and the Exchequer Reservoir on the Merced River with a capacity of 279,000 acre-feet serving a net irrigated area of 125,000 acres in the Merced Irrigation District.

In the southerly part or Upper San Joaquin Valley, ground water as well as surface supplies have been used. Originally artesian flows were found in many localities. Large areas have been developed through pumping from wells, and in many cases where the surface supply is small or uncertain it is supplemented by pumping during the latter part of the season.

Of the 1,200,000 acres now under irrigation in the Upper San Joaquin Valley, about one-third is served from surface supplies, one-third from streams and wells and one-third entirely from wells. In this area no mountain water storage has been developed for irrigation purposes alone. On the San Joaquin River, storage for power regulates some water for irrigation. Smaller amounts of power installation with little or no regulatory storage have been developed on the Kern and Kaweah rivers.

Buena Vista Lake in the trough of the valley stores flood waters of the Kern River for

(Continued on page 20)

75,000 Square Miles to be Mapped Costing \$1,660,000 and 14 Years Work

By **EVERETT N. BRYAN**, Hydraulic Engineer, Division of Water Resources

A DEFINITE program of topographic mapping in California has been agreed upon by the district office of the U. S. Geological Survey and the State Engineer's office having as its object the completion of a reasonable satisfactory topographic base map of the State of California.

The Federal government, through the local office of the U. S. Geological Survey, and the State of California, through the office of State Engineer, are carrying on this work on a dollar for dollar cooperative basis and the program arranged is the culmination of some five months effort beginning with a conference on May 8, 1931, to which all major agencies concerned with the production and use of these maps were invited to send representatives.

The U. S. Geological Survey, the State Engineer's office, the State Division of Highways, the Corps of Engineers U. S. Army, the California Forest Experiment Station, the California Economic Research Council, the State Division of Mines, the U. S. Forest Service and the College of Agriculture of the University of California were all represented by personal appearance at this conference and several other agencies made appearance by letter.

75,000 SQUARE MILES

The program arranged provides for the mapping of all previously unmapped areas, the remapping of all areas for which there are presently available only the U. S. Army tactical maps, the resurvey of all areas for which there are presently available only U. S. Geological Survey topographic maps of a scale of 1:250,000 surveyed prior to 1890, the completion of surveys made by the city of Los Angeles in San Bernardino, Riverside and Imperial counties, the resurvey of certain mining, recreational and forested areas in the northern Sierra done some 40 years ago, and the resurvey of highly developed areas in western San Bernardino and Riverside counties and

in San Diego County wherein there have been many cultural changes and there are presently available only small scale maps done 30 to 35 years ago. **Completion of the program involves the mapping of some 75,000 square miles or 47 per cent of the area of the State and it is estimated will cost \$1,660,000. On the basis of expenditures proposed during the current year it will require fourteen years, or until 1945, to complete the program.**

AREAS SCHEDULED

The more important general areas which are scheduled for mapping proceeding from north to south include the following:

1. The north coastal area for which there are now available only the U. S. Army tactical maps, which are wholly inadequate for general purposes.

2. The extreme northern and northern portions of California for which there are now available only the old U. S. Geological survey quadrangle sheets of a scale 1:250,000 done prior to 1890.

3. Previously unsurveyed or only partially surveyed areas in the Clear Lake to Redding Coast Range section, for which there are now no published maps available.

4. Recreational, mining and forested areas in the northern Sierra from Quincy south to Yosemite, for which there are presently available only U. S. Geological Survey Quadrangles done some 35 to 47 years ago.

5. Unmapped areas on southern San Joaquin Valley floor.

6. Areas in San Bernardino, Riverside, Orange and Imperial counties, for which there are now either no published maps or only those done 30 to 35 years ago.



Everett N. Bryan

Arrangement of the program required a determination of two very important factors—the scales which should be used and the order in which the work should be undertaken. While it was readily agreed that no new work should be done on the scale 1:250,000 (i.e., 4 miles to the inch) there was considerable room for choice between the larger scales and an earnest desire was manifested among the various users of the maps for large scale work.

There is, however, a very rapid increase in cost with an increase in scale and if the pro-

Slip of Pen Might Cost Him \$30,000 Yet Gunston Smiles

ALMOST any day of the week, George T. Gunston, disbursing officer of the Department of Public Works and assistant secretary of the California Highway Commission, can put his hand in a drawer of his desk and pull out a million dollars or so. On a recent Wednesday, bid opening day, he could exhibit \$2,500,000.

But while it's all perfectly good money, it's not cash or even currency—just contractors' checks deposited as guarantees with their bids. The total of them runs high on an afternoon when bids on a number of jobs are opened. Last week for instance the bidders on one job alone had up \$581,000. All of this paper is returned within twenty-four hours except the check of the lowest or successful bidder who gets his back when he furnishes a satisfactory bond upon the execution of the contract.

SIGNS 10,000 CHECKS

As disbursing officer Mr. Gunston sends out about 10,000 checks a month in payment of all types of departmental bills, disbursing approximately \$3,000,000 a month for highways alone. By the use of a multiple pen-holding mechanism he can sign five checks at a time. Figure out how long it takes him.

He has some queer experiences with contractors. One forgetful lowest bidder put his check in his pocket instead of in the bid envelope and of course lost the contract. Another was one cent short of the required amount and was ruled out. Another with \$35,000 up in securities was \$5 short on a job approximating \$350,000 and lost it.

CAPTAIN OF ARTILLERY

Handling all this paper representing the State's and other people's money is a ticklish job because Gunston is responsible for any mistake and a mistake might mean a trifle or thirty or forty thousand dollars, yet he sleeps o' nights and smiles.

For Gunston, a soldier, is endowed with the necessary courage for such a job. He served with the Washington National Guard during the war and is commander of Battery D, 143d Field Artillery, California National Guard of Sacramento, equipped with four 75 millimeter guns, manned by four officers and 66 men.



THERE'S MILLIONS IN IT, speaking of the big black safe, but not a dollar you can spend—all in the custody of George T. Gunston, disbursing officer of the Department of Public Works. He has handled as high as \$2,000,000 a day but all of it in bidder's guarantee checks, not a cent in cash or even currency.

31 States Changing License Plate Hues

Thirty-one states will change the color combination for automobile license plates in 1932, and 23 different motifs will be used throughout the country, indicating that almost every hue will be represented in next year's parade, according to a survey by the American Automobile Association.

The national motoring body pointed out that 13 states and the District of Columbia will retain the 1931 colors, reversing them as to background and lettering, indicating a trend back toward standardization of colors. California, in this group, will revert to black on orange.

Tons of Explosive Used to Stop Sinking of Alto-Waldo Road Fill

By J. H. SKEGGS, District Engineer

ONE of the most important links of the Redwood Highway constructed to date is the Alto-Waldo unit officially opened to the public November 22.

This section of road, although only 2.45 miles in length from northerly limits at Alto to southerly limits at Waldo called for the solution of many extremely original engineering and construction problems including the dynamiting of a fill to stop continued subsidence.

The project involved a bridge structure across Richardson Bay and fills across an arm of the bay between De Silva Island and the mainland north of the bridge.

The maintenance of fills constructed through marsh and tidelands has been a source of trouble and expense to the railroads for years. However, it is even more serious and baffling as a highway problem.

DROPS INTO MUD

Fills across marshes are usually sunk as far into the mud as the heavy equipment with which they are constructed will sink them. During construction they are brought to grade many times, only to have huge slices or sections to the fill shear off and drop several feet into the mud, displacing it and causing an upheaval on the sides. Finally a state of apparent floating stability is reached, but on opening the fill to the pounding of heavy traffic it commences a slow subsidence of only a few inches per year but steady and relentless over a long period of time. The railroads brought their tracks to grade by adding ballast but the remedy for a highway is not so simple.

The settlement of a fill is never exactly uniform. This in itself tends, by removing the support underneath and distorting the mass, to disintegrate the wearing surface.

It causes depressions which, even if slight, prevent surface drainage due to the wide roadway and the light crown allowable. These depressions cause puddles and splashing during wet weather and tend to further disintegrate the surface by water seeping through.

Until the subsidence has continued over a period of several years, and the road has

been repeatedly patched and smoothed up, it is not advisable to invest in a permanent or heavy type of pavement.

On this project across the arm of the bay, between De Silva Island and the mainland, the mud was sounded to a depth of fifty feet prior to construction.

During construction with the usual methods the mud was heaved several hundred feet outward on either side of the road grade and it was apparent that the problem of subsidence was to be particularly acute.

Although highway problems in the marshes of New Jersey were hardly comparable to those of California, due to the large percentage of vegetative matter composing the eastern marshes, it was considered advisable to bring to California Mr. J. A. Williams, District Construction Engineer of the New Jersey Highway Commission, for the purpose of consulting on blasting methods of sinking fills successfully used in New Jersey.

TONS OF EXPLOSIVE

The New Jersey methods had to be altered considerably to fit local conditions, but the results desired were the same.

Tons of 60 per cent nitroglycerin gelatin were used in blasting the mud from beneath the heavier fill material, settling it after several blasts to the hard bottom beneath. The fill was sounded after each blast to determine the effect of the shot.

The full value of this experiment will not be known until all the data has been compiled and analyzed, which includes the sounding of displaced material on the sides as well as that within the roadway section.

It is definitely known that a fill can be forced down to bottom even with the great depth of mud here encountered. It is hoped to determine from the massive data obtained on this project just what is the maximum depth to which a fill can be economically forced to produce final stability.

It is known that a portion of the roadway material was displaced with the mud and lost for roadway purposes. The amount of this should be determined from analysis of side borings. Portions of other fills on this project were partially sunk, but were not



SLOUGH OF DESPOND, this was for the engineers until they got mad and dynamited the fill that wouldn't fill on the newly-opened Alto-Waldo link of the Redwood Empire highway across an arm of Richardson Bay. Note the cracks showing the settling despite repeated dumping of hundreds of tons of road material. Tons of explosive finally blasted the way to hard bottom.

forced clear to the hard bottom in an effort to find a point of balance or stability without the extreme measures resorted to.

The public in riding this short section of highway can hardly be expected to realize the difficulties of its construction, the invisible forces of nature which had to be overcome. They can, however, enjoy the smooth wide surface, the picturesque bridge and the saving in time due to decreased distance, increased width, improved alignment and inherent safety features.

They should particularly appreciate the "braided crossing" at the southerly end of the bridge which will sort out with perfect safety 20 per cent of the traffic bound for Mill Valley and adjacent vicinity without any slackening in speed of that 20 per cent or the other 80 per cent speeding northward along the main highway.

This Alto-Waldo link receives and delivers traffic at the door of Sausalito. It saves in itself $1\frac{1}{4}$ miles distance over the existing route between these limits, but together with the San Rafael to Alto cutoff opened last

year saves 30 per cent of the distance or approximately 4 miles over the previous highway between Sausalito and San Rafael.

It reduces the curvature over 90 per cent between the two cities, providing alignment comparable to the best railroad alignment of the country, and embodies in basic engineering design the ultimate in safety features.

GOT THE DECISION

A farmer west of town had been using his tractor to pull mired motorists out of a mudhole at \$1 per jerk. More money in it than farming. A city drayman looked on with envious eyes and started competition. The tractor was the best mudhorse and got most of the business.

The drayman telephoned the county attorney, and asked if a man could operate a tractor on the public highway without a license. The county attorney looked up the law and found that "Tractors used for road work other than hauling material shall be exempt."—*Minnesota Highway News*.

He—That driver ahead must be Miss Flditch, my old school teacher.

She—Why?

He—She seems to be so reluctant about letting me pass.—*Motor Land*.

Pay Roll Dollar Reaches 42,000 Men

(Continued from page 1)

Within the last ten months, the Highway Commission has passed \$500,000 in direct aid to localities in the State, meaning that in each instance the sum has been more than matched by local enterprises and reflected back in the labor employing agencies.

OUT OF SAVINGS

In the progress of the year's work the Department saved \$1,500,000 out of its maintenance budget, due to falling prices of material and favorable work conditions. This sum was made immediately available for extra maintenance work on the highways.

During the month of October, 3600 married men were given employment on a part-time basis over a period of five months. These were in addition to the maximum on regular pay rolls. The personnel was selected by the mayors and American Legion officials from localities in the vicinity of the work to be done.

The pay roll of the Highway Division, all inclusive of its activities, now carries 14,000 employees. The pay rolls of contractors in the division carry about 12,000 more men. Going deeper into the inquiry, \$18,000,000 reaching the counties is estimated to have added directly about 7000 more men to the local pay roll, but the full results of the stimulus to county enterprise is reflected far beyond the actual personnel of the pay rolls.

Material men, transportation companies and technical labor have been drawn on heavily through this activity.

The \$48,000,000 schedule of the Department of Public Works, plus the \$18,000,000 fund going to the counties, means that under the accelerated program something like \$66,000,000 has been set in motion against the unemployment situation this year. Represented in this is something like \$10,000,000 of special appropriations made by the Legislature in extension of going building construction program.

There may have been larger amounts open for expenditure in the employment of labor, but it is doubtful that any have touched the taxpayer more lightly. Every phase of construction, building or maintenance, is on a pay-as-you-go plan. No bonds have been issued or any additional taxes imposed.

Back of this is the 3-cent gasoline tax and its auxiliary license money, which, for the last

WISCONSIN THANKS CALIFORNIA

Executives of the Department of Public Works are occasionally called upon by officials of other states for information concerning California methods and practices. Recently Chairman Thomas J. Pattison of the Wisconsin Highway Commission called on Adolph N. Sutro, District Right of Way agent at Los Angeles, and sends his thanks for the assistance given him in the following letter from the state capitol at Madison, Wisconsin:

Mr. Adolph N. Sutro
1111 Associated Realty Building
Los Angeles

My dear Mr. Sutro:

I wish to express my appreciation to you for the many valuable suggestions I received from you and from the members of the State Highway Department in Division No. 7, where I obtained a great deal of information which will be of value in the Highway Department of the State of Wisconsin, more particularly with reference to your plan of acquiring right of way. I have discussed your system with our Commission, and we are very much impressed and believe that we can follow your plan of acquiring right of way and save the State of Wisconsin a great deal of money. * * * This question of acquiring right of way in Wisconsin has for some time been a serious problem, and I believe that this plan will very materially reduce our costs of right of way.

I wish to thank you for the very fine consideration you gave me while at your office, and to say that I will be very glad to hear from you at any time.

Very truly yours,

WISCONSIN HIGHWAY COMMISSION
By Thos. J. Pattison, Chairman

biennium, netted the State \$64,000,000, and the counties \$31,000,000. This vast fund is apportioned by statute and goes directly to the disbursing agents of the Highway Department and to the counties.

The prompt distribution of these funds was made possible through adjustments and elimination of red-tape delays, thus meeting the Governor's insistence that the maximum amount of employment be provided at the earliest practical date.

It is accepted as a fact that of the millions of dollars being spent by California, fully 85 per cent ultimately reaches a labor pay roll.

Figures that Tell the Facts

The object of this tabulation is to show at a glance the far reaching distribution of State funds disbursed by the Department of Public Works. The total of employees or ultimate recipients of these funds as shown here is based on (1) department pay rolls, (2) contractors' pay rolls, (3) county construction and pay rolls aided by gas tax revenue, (4) joint highway district work aided by gas tax, and, (5) materialmen's pay rolls increased from like source. This total is not a pay roll count of individuals but a computation, in part, based on an accepted formula.

DEPARTMENT OF PUBLIC WORKS EMPLOYMENT RECORD FOR 1931

Public Works Department employees-----	14,000
State highway contractors' employees-----	12,000
County highway contractors' employees-----	7,000
County maintenance employees-----	4,000
Joint highway district enterprises-----	1,500
Special aid allocations-----	700
Materialmen's requirements-----	1,200
Building construction contracts-----	2,000
	<hr/> 42,400

1931-32 BIENNIAL PAY ROLL RESOURCES

Gas and subsidiary tax, biennium July 1, 1929-June 30, 1931-----	\$54,945,509 69
Federal aid allotments paid on completed projects-----	8,425,625 54
Revenues from cooperative projects-----	747,808 05
Gas and subsidiary tax paid to counties-----	31,844,342 42
Total-----	<hr/> \$95,963,285 70
Special legislative appropriation-----	10,000,000 00
Grand total-----	<hr/> \$105,963,285 70

Whole "Family" Invited to Xmas Party

THE "one big family" sentiment so marked at every gathering of Department of Public Works employees under the present administration has developed into plans for a big "Family Christmas Party" on December 23d at which Governor James Rolph, Jr., will be guest of honor and all employees of the Department are invited to be the guests of Colonel Walter E. Garrison, director, James I. Herz, deputy director, and executive heads of the department.

The party will be staged at the Elks Temple, Sacramento, and the merry Yuletide festivities will begin with a huge Christmas tree and entertainment for the kiddies in the afternoon at which Santa Claus will be present, of

course, and distribute presents, candy and ice cream to all the youngsters.

Then when the children have been taken home and snugly tucked into bed with visions of sugar plums, etc., the mothers and dads will return to the hall for the big dance that will last until the wee small hours with a lot of favors and merriment characteristic of Yuletide.

The big Christmas tree and piny decorations gathered from snow covered mountains will be provided by the maintenance crew of District Ten at Donner Summit.

It is pointed out that the efficiency of motor car engines has increased forty five per cent in five years. And the efficiency of drivers, how much?

Joint Hearings by State Water Bodies in South Evidence Keen Public Interest

EVIDENCE that the critical nature of California's water problem is being widely recognized and that the solution must come from a state-wide program of water conservation was shown by the public interest and attendance at the series of joint meetings held in southern California by the Governor's Water Commission and the Joint Legislative Water Committee on November 2, 3, 4 and 5. These meetings were programmed by the two bodies in order that they might

Joint Legislative Water Resources Committee, presided. Officials of San Diego County irrigation districts outlined some of their difficulties and stressed the need of further conservation of local waters. State assistance was requested in modifying the present riparian laws of the State, in order to allow proper conservation of the State's waters. The necessity of importing additional water from the Colorado River to meet the ultimate needs was brought out by city authorities.



GOVERNOR ROLPH'S COMMISSION officially titled the California Water Resources Commission as it appeared at a joint hearing in southern California with the legislative committee, is shown in this photograph. The members are: (front row, left to right) A. B. Tarpey, Vice Chairman Shannon Crandall, Chairman Matt I. Sullivan, James M. Burke, W. B. Matthews. In the rear row (left to right) are Jesse Poundstone, R. C. Harbison, Francis Carr, Major A. M. Barton, State Engineer Edward Hyatt, Jr.

hear from the citizens of the southern part of the State regarding their local problems of water shortage and their recommendations as to how proper conservation may be accomplished.

On November 2d at a joint session in San Diego, representative citizens of the city of San Diego and San Diego County presented the conservation and flood control problems of the city and county, particularly of the San Diego River and Mission Bay. Senator B. S. Crittenden, chairman of the California

PROBLEMS DISCUSSED

Assemblyman George B. Bowers made a short introductory talk and introduced the San Diego representatives. Tom Allen, Charles Hoopes, Colonel Ed Fletcher, Assemblyman Ed L. Head, B. D. Phelps, C. L. Myers, H. N. Savage, Hal G. Hotchkiss and Senator William E. Harper were among the speakers who discussed the San Diego River problems.

At the afternoon session, Mayor Austin assured the full cooperation of the city of



JOINT LEGISLATIVE COMMITTEE members who participated in water hearings in the south are shown above. In the front row, from left to right, are Assemblyman Edward Craig; Assemblyman Chester M. Kline; Senator B. S. Crittenden, chairman; Assemblyman Harold C. Cloudman; Assemblyman Robert L. Patterson. In the back row, left to right are Senator C. C. Baker; Senator Frank W. Mixer; Assemblyman Robert P. Easley; Joe Nolan, sergeant at arms; Assemblyman Frank S. Israel; Senator Andrew P. Schottky.

San Diego in working out a conservation program. Warren Lee Pierson, V. B. Westfall, A. H. Anthony of the Fallbrook Irrigation District and Thomas H. King, Consulting Engineer of San Diego, discussed the irrigation problems of this territory.

Following the joint meeting, an inspection trip was made through the San Diego River basin, visiting El Capitan and several other dam sites.

On the following morning, the Fallbrook Irrigation District was visited and the water shortage of this area was evidenced by the retrogression of highly developed orchards. The question of water rights has prevented conservation of flood waters and development of a proper water supply for this valuable section.

Proceeding to Riverside the second meeting in southern California was held to hear from the people of Riverside, San Bernardino, Orange and Imperial counties. Nearly one hundred citizens and officials of local organizations showed their interest by their attendance.

RIVERSIDE MEETING

The representatives from the different counties explained their viewpoint on the State Water Plan. Local problems in the Santa Ana River Basin, the Mojave River Basin, the Imperial Valley and the San Jacinto area

were outlined and discussed. Assemblyman Chester M. Kline, member of the Joint Legislative Water Committee presided.

William Jerome, O. T. Stephens and Ross Shafer spoke on the viewpoint and problems of Orange County. J. P. Hoffman of Mojave Valley, J. W. Sallee of Jacinto, Francis Cuttle of Riverside, Charles C. Childers of Imperial Valley, Mayor Joseph S. Long, Dr. Horace Porter, former Mayor of Riverside, Assemblyman A. E. Brock, J. J. Prendergast and H. H. Hale discussed the various phases of the problem.

James M. Burke and Francis Carr of the Governor's Commission, Senator Crittenden, and Assemblyman Robert P. Easley of the Joint Legislative Water Committee outlined the work of the Commission and Committee and of the necessity for developing a plan of conservation state-wide in its scope, that will be fair to all sections.

STATE PLAN OUTLINED

At the close of the meeting the official party went to Monrovia to attend a dinner meeting as guests of the Associated Chambers of Commerce of the San Gabriel Valley. Twenty-two municipalities of this valley were represented at the meeting. State Engineer Hyatt outlined the State Water Plan as recommended by the Department of Public Works and discussed the nature and costs of the units of the

Three Counties Join in Dedication Of New Sutter Basin Highway

GOVERNOR JAMES ROLPH, JR., journeyed from Sacramento to Robbins on Saturday morning, October 24, and formally opened the new Sutter Basin highway that brings the east and west sides of the valley in closer contact, links the Robbins district with Yuba City and Marysville and affords an all-year road between those cities and Woodland.

The section of road recently completed is a portion of a joint highway project from Robbins to Tudor in which Sutter and Yolo counties share the cost with the State.

A crowd of some three thousand enthusiastic citizens greeted the Governor, including official and civic representatives from Sutter, Yolo and Yuba counties. A caravan of seventy cars brought 350 residents of Woodland headed by Mayor H. I. Bobb, Fred Shaffer, Secretary-Manager of the Chamber of Commerce, and city and county officials.

ADDRESS BY GOVERNOR

Following a luncheon attended by the gubernatorial party and notables of the three counties, Governor Rolph addressed the assemblage telling them of the great pleasure the occasion afforded him and reciting the history and progress of the joint highway project that was started by Yolo and Sutter counties in 1929.

Other speakers were William O. Russell, chairman of the Yolo County Board of Supervisors; Arthur C. Huston, Sr., Woodland; A. A. McMullen, Yuba City Publisher; ex-Assemblyman Fred Noyes of Sutter County; Supervisor Frank B. Edson of Yolo County; Supervisor Frank H. Graves of Sutter County, chairman of the joint highway commission; W. T. Ellis, chairman of the Yuba County Board of Supervisors, and others.

At the conclusion of the speech making Governor Rolph left the platform and advancing to the center of the new highway severed the barrier ribbon, thus figuratively dedicating and opening the highway to traffic.

FREE BARBECUE

A free barbecue for which 1000 pounds of choice beef and 400 dozen rolls were supplied,

races in the community plunge and a football game added to the festivities attending the dedication.

The initial section of the road recently completed is that portion of the joint highway project from Robbins to Tudor, about ten miles. The improvement consists of grading to a proper roadway width and surfacing same with six inches of asphalt concrete surface on a crushed rock base when new construction is done or a comparable standard where widening is made. The total cost of the recent improvement is \$284,900.

COST DIVIDED

Of this amount, the State furnished \$100,000 and Sutter and Yolo counties the balance. Inasmuch as the assessments against the counties are spread over a period of five years, it was necessary for Sutter County to underwrite portions of the cost not borne by the State, until further county payments accrue.

With the completion of the present improvement, there is a continuous highway connecting the west side highway at Woodland with the east side highway at Yuba City. This shortens the present highway between the cities by about twenty miles. It furnishes easy communication between Yolo and Sutter counties. Over it will be accommodated a large volume of commercial traffic carrying products from a rich agricultural district. It was essential for the development of a school system throughout the year.

NEW BRIDGE NEEDED

For future work, there will be necessary some realignment between Robbins and Knights Landing. Widening of pavement between those points will also be advisable as traffic increases. When funds become available and authority can be secured from the War Department, a new bridge across the Sacramento River at Knights Landing will be advisable. The present roadway crosses the river on a bridge owned by the Southern Pacific.

The use of this bridge for highway purposes is under license that may be revoked. The bridge is narrow and inadequate.



A GREAT DAY it was for Robbins, Sutter County, when the newly completed link of the Sutter Basin highway was officially opened and dedicated at that town by Governor Rolph. A fine spirit of cooperation was shown by all the people of the Sutter Basin section in making the event a memorable occasion. Representative citizens from all parts of Yolo, Sutter and Yuba counties gathered in large numbers to greet Governor Rolph and enjoy a most interesting program that lasted throughout the day. These events included a free barbecue prepared for 2000 visitors, swimming races in the community pool and a football game, following the official luncheon tendered the Governor and his party. The upper picture shows the crowd that pressed around the speaker's stand being addressed by Governor Rolph whose figure is indicated by the arrow mark. Seated on the stand are the Supervisors from Yolo, Sutter and Yuba counties and other officials and notables on the list of speakers. The lower picture shows the Governor cutting the ribbon stretched across the highway, thus officially opening the new road link to traffic. Assisting in this ceremony are State Senator W. P. Rich of Marysville on the right of the Governor and on the left, County Supervisor E. E. Reeves of Yuba City.



Work Divided Between North and South

(Continued from page 8)

gram of mapping was to be completed in reasonable time with the funds which would probably be made available it was necessary to make some sacrifice on this point. In this connection the following comparative estimates of cost are of interest:

Field scale	Published scale	Cost per sq. mile
1:192,000	1:250,000 (4 mi. to 1 inch)	\$10 to \$15
1:96,000	1:125,000 (2 mi. to 1 inch)	\$15 to \$25
1:48,000	1:62,500 (1 mi. to 1 inch)	\$40 to \$60
1:31,680	1:31,680 ($\frac{1}{2}$ mi. to 1 inch)	\$50 to \$80

While the scales agreed upon in a few cases are not as large as desired by some of the users it will be noted that fourteen years are required to complete the program even with the smaller scales adopted.

DIVISION OF WORK

In the matter of order of mapping there was also some difficulty in arriving at a schedule which would be generally satisfactory. Each area and interest, impressed with the seriousness of its own need, would, if given its choice, place its own work first. It is manifestly unfair and impracticable, however, to confine all work for a great length of time to one section of the State.

In order to secure maximum efficiency in field work it is necessary to divide the work fairly equally between the northern and southern portions of the State, confining the winter work to southern California. It has appeared equitable and proper also to distribute the annual expenditures among the various interests such as agriculture, mining, forestry, recreation, etc. In the program of mapping agreed upon, therefore, the schedule of annual expenditures is divided fairly equally between the various geographical areas and interests.

The possibilities of expediting completion of this program by adoption of aerial methods in place of the ordinary ground surveys will not be overlooked. An area which will afford a reasonable test both in the matter of cover and slope has been selected in the vicinity of Clear Lake and it is expected that within the next few months aerial mapping will be given a test by which it will be possible to compare the new method with the old in matter of both cost and accuracy.

REVISION EXPERIMENT

Another experiment which will be tried as soon as weather conditions will permit and the work can be organized is that in connection with a cultural revision of some of the older quadrangles. In the vicinity of Lake Tahoe where there has been a very marked recreational development in recent years the only topographic sheets available are those surveyed more than 40 years ago. These are published on the 1:125,000 scale and it is believed the topography is sufficiently accurate that they can be made to serve present purposes reasonably well if the culture is revised to show the new roads, trails, settlements, etc. The Truckee sheet has been selected for this test and it is hoped to work out some method by which all adjoining sheets may be redone at reasonable cost.

In San Bernardino, Riverside and Imperial counties some 15,000 square miles have in recent years been surveyed by the city of Los Angeles in connection with its investigation of the Colorado River project. These surveys have not been published but blue print maps thereof are available on a scale of 1:125,000, lacking, however, the land lines and some of the other detail of the U. S. G. S. topographic sheets. It is expected to complete these surveys and publish the maps.

Experimentation will start within the year on the Hinkley quadrangle in the vicinity of Barstow in an effort to work out the best method and determine the cost.

As a necessary preliminary to proposed topographic mapping datum points must be established for elevation and for position. These datum points are permanent marks of which a list and descriptions may be obtained from the Geological Survey and they therefore are invaluable to California engineers. Local surveys for highways, canals, dams and reservoir sites and all other engineering projects can be referred to these permanent marks thus making each such survey in the State a part of an homogeneous whole.

The flapper, in a heavy sport roadster, came to a screaming stop in front of the traffic officer on a busy street. Said she:

"What's the big idea, flat foot, of no lights here?" Officer (annoyed): "I'm the light on this corner, lady."

Flapper: "Then turn green so I can cross!"—*Mississippi Highways.*

Sierra County Sees Good Significance in Governor's Visit

(Editorial in Downieville Messenger)

THE GOVERNOR'S visit to Downieville was the most important thing that has happened in Sierra County for many years. Its significance may not be fully comprehended by some, but to those in close touch with the situation it is of tremendous importance.

In the Governor's party were men who can do us the greatest amount of good; men like Col. Walter E. Garrison, Director of Public Works, and C. H. Purcell, State Highway Engineer and Chief of Division. These men and the Governor himself listened attentively to what was said by the speakers for Sierra County, who told of the county's needs. They not only listened, but they saw for themselves and gained a close-up, first-hand knowledge of conditions in this county.

They drove over our crooked roads, and agreed that they sorely needed fixing. They were told of how one of our supervisors is compelled to go through three counties and travel a distance of more than 70 miles to attend board meetings at the county seat, a distance of about 20 miles across the mountains. They were told how easy and inexpensive it would be to keep Yuba Pass open in the winter time, the most logical route across the mountains to Reno.

They were told that it would be wholly practical to solve the water problem, cure the financial depression in this State and allow the resumption of hydraulic mining at one and the same time by the building of restraining dams, thereby holding back the flood waters to be used when needed.

That the Governor and his party were impressed with what they heard and saw there is no doubt. There is little doubt, also, but that they will lend their friendly efforts in helping Sierra County with its problems. The Governor did not come here to win votes; the election is past. He came here prompted by a genuine desire to acquaint himself with the actual needs of the county, and to help us in any way he can.

"Freddie," said teacher, "give me a sentence using the word 'dilemma'."

Freddie had overheard certain remarks at home, and out of his subconscious store of worldly wisdom he drew this reply:

"People who hurry across railroad crossings dilemma sight quicker than people who stop, look and listen."
—*The Earth Mover.*

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
JOHN W. HOWE.....Editor

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CALIFORNIA LEADS

The public today demands pavements "as level as a floor" to permit comfort at driving speeds of 50 to 60 miles per hour. California has recognized this public demand and is now building them almost "as level as a floor," although each year sees improvements in surface smoothness.

Upon the completion of each project, its roughness is measured by an instrument called a "vialog." The instrument records the inches of vertical roughness per mile of pavement. The record in 1930 was 4.8 inch per mile and was made on two Portland cement concrete paving jobs, one north of Santa Maria in Santa Barbara County, and the other at Liberty Grade in Los Angeles County.

A roughness of 4.8 inch per mile of pavement is an average roughness of only one-fourth inch every 275 feet. That it is almost "as smooth as a floor" can be realized by comparing this with smoothness specifications. Most highway specifications require that the pavement shall be so smooth that it will not show a variation of over one-quarter inch on a 10-foot straightedge; yet they build them so smooth in California that there is only an equivalent roughness of one-quarter inch in 275 feet.

The season record for placing pavements was made on the Balboa Avenue-Torrey Pines Road in San Diego County. They placed a daily average of 935 feet of standard Portland cement concrete pavement during the time it took them to build the project. The average production per day for all Portland cement concrete paving jobs in the State was 698 feet.—*Roads and Streets.*

Pauline: Oh, look at the poor old man all bent over with rheumatism.

Paul: Rheumatism, my eye! It's Jack coming back from a ride in a rumble seat.—*Our Sun.*

Study Covers Supply for 40 Years

(Continued from page 7)

use on the lower lands served from this stream. Tulare Lake, a depression south of the ridge across the valley formed by the delta of the Kings River, receives part of the flood flow of that river and flood waters from all streams south to the Kern. Reclamation in Tulare Lake restricts the area of overflow in normal years and the water stored here is used on the adjacent lands.

STORAGE CONSIDERED

Storage for irrigation at or near the edge of the valley has been under active consideration for many years on the San Joaquin, Kings and Kern rivers. While the physical conditions are favorable, adjustments of water rights and difficulties in organization have delayed the construction of any of these works. The reduced run-off of recent years has also been a factor in the delay. However without storage, the waters of the streams have been put to a high degree of utilization about ninety per cent of the total run-off of the past fourteen years being used on several of these streams.

In the investigation of the water resources of the State made by the Division of Water Resources, an inventory of all waters of the State has been made, and the water requirements have been estimated in each of the seven basins into which the State has been divided. In the study of the San Joaquin Valley, an Engineering Advisory Board composed of eminent consulting engineers has materially aided in outlining the investigations and advised on all phases of the problems. During the past two years the members of this Committee have been, I. H. Althouse, W. H. Code, B. A. Etcheverry, F. C. Herrmann, H. L. Haeli, R. V. Meikle and G. L. Swendsen.

MOUNTAIN DRAINAGE AREA

The mountainous drainage area of the San Joaquin River Basin contains 18,178 square miles, and contributes 16.8 per cent of the stream flow of California. In determining the water supply of the San Joaquin Basin, a study was made of the forty year period from 1889-1929. This period starts with several wet years, contains both wet and dry cycles including one of the largest and driest cycles of record. The mean seasonal run-offs are estimated to be as follows:

	<i>Acres-foot</i>
40 year mean 1889-1929-----	11,980,000
20 year mean 1909-1929-----	10,160,000
10 year mean 1919-1929-----	8,547,000
5 year mean 1924-1929-----	8,137,000

The variety of uses of water in California possibly exceeds that of any other State in the Union. The predominant use, however, is that for irrigation, and undoubtedly this use will continue to predominate for many years; therefore it has been used as the basis for estimating the water requirements of this area.

In order to determine the ultimate future water requirements a complete classification of all lands in the San Joaquin Valley floor and adjacent foothills was made. A total area of 8,910,000 acres exclusive of the area in the Sacramento-San Joaquin Delta was examined and classified to determine the suitability of the lands for profitable development under irrigation. Of this gross area,

there is a net irrigable area of 5,704,000 acres that may at some time require a water supply. It is estimated that there were 2,033,000 acres or about one-third of this total net irrigable area, irrigated in 1929.

From a study of the average net use based on data collected for all the developed areas along the eastern side of upper San Joaquin Valley covering the period 1921-1929 and from supporting results in the lower San Joaquin Valley, the water requirements are estimated for the Upper San Joaquin Valley on the basis of an average seasonal allowance of two acre-feet per net acre of irrigable land.

RESULTS OF STUDIES

Similar studies were made for the Lower San Joaquin Valley and foothill areas and a gross allowance determined for all lands which might at some time be irrigated. In estimating the ultimate water requirements, it has been necessary to take into account the marked difference between the upper and lower portions thereof in the adequacy of local tributary streams to meet the ultimate irrigation demand and the availability of underground storage for the utilization of the water supplies. The gross and net allowances and net use per unit of area in the lower San Joaquin Basin vary with the geographic location of the irrigable areas with respect to water supply. These values have been established by studies of requirements in fully developed areas.

Based upon the net irrigable areas and the per acre requirements determined for each portion of the basin, the ultimate seasonal water requirements have been estimated for the San Joaquin River Basin excluding the Sacramento-San Joaquin Delta as follows:

Gross allowance in acre-feet..	13,326,000
Net allowance in acre-feet....	11,720,000
Net use in acre-feet.....	10,952,000

A comparison of the water supply and ultimate requirements show a deficiency in the San Joaquin River Basin.

The local supplies in the lower San Joaquin Valley for areas now under irrigation are generous in amount and dependable in occurrence.

In some portions of the upper San Joaquin, the use of water on present development exceeds the natural replenishment. Many farmers are finding it so costly to obtain an adequate supply of water that farms are being abandoned and are reverting to dry farming or pasture. Some 400,000 acres of highly developed land in this area are drawing from their underground supplies at a rate greater than the supply naturally available to them.

REVERT TO DESERT

Of these 400,000 acres, probably some 200,000 acres will go back to desert condition because there is only half enough water for the total area under cultivation. These 200,000 acres are worth more than \$50,000,000 and yield annually products having a value greater than \$20,000,000, three quarters of which are not in a class of those that are overproduced.

If retrogression is allowed to proceed on these farmed lands its effect will be felt in the urban areas

State Plan for Storage and Distribution

(Continued from preceding page)

in the immediate vicinity and in the large metropolitan areas—Los Angeles and San Francisco. The abandonment of these lands would result in a loss of several millions of dollars in annual returns to business in these metropolitan areas.

To meet this critical situation the State Water Plan proposes the purchase of the so-called "grass land" rights along the San Joaquin River. This water together with the water now wasted in the San Joaquin River after satisfying the demands of crop lands would have been sufficient during the 12 year period 1917-1929 (a cycle of drought) to meet the immediate needs of the 400,000 acres in the Upper San Joaquin requiring a supplemental water supply.

FRIANT RESERVOIR

Storage would be obtained by the construction of Friant Reservoir on the San Joaquin River about 20 miles northeasterly from Fresno. The dam proposed would be 252 feet high, creating a reservoir with a gross capacity of 400,000 acre-feet and a usable capacity of 270,000 acre-feet above elevation 467 feet, the diversion elevation of the San Joaquin River-Kern County Canal.

Distribution would be obtained through the San Joaquin River-Kern County Canal to Kern River with a maximum diversion capacity of 3000 second-feet and the Madera Canal with a maximum capacity of 1500 second-feet.

A small pumping system of 20 second-feet capacity is proposed to serve the Magunden-Edison area in Kern County. Kern River water made available by exchange with San Joaquin River water would be diverted from the East Side Canal.

A conveyance channel connecting the Sacramento and the San Joaquin rivers in the delta and a pumping system from the delta up the San Joaquin River are proposed.

The construction of the Sacramento-San Joaquin Delta cross channel will permit the transference of water from the Sacramento River to the San Joaquin Delta now connected by two channels of inadequate capacity, particularly when exportation of water from the delta to San Joaquin Valley is effected.

PUMPING SYSTEM PLANS

The San Joaquin River pumping system would consist of dams and pumping plants in the San Joaquin River as far upstream as the Merced River and artificially constructed channels from the Merced River to the Mendota Weir. This pumping system would deliver water to lands now being irrigated from the San Joaquin River. The furnishing of a Sacramento supply to these lands and the maintenance of fresh water in the Sacramento-San Joaquin Delta by the Kennett reservoir would permit the storage of San Joaquin River water in the Friant reservoir and its conveyance to the lands of water shortage in the upper San Joaquin Valley.

With the purchase of the so-called "grass land" rights, and by utilizing the surplus waters of the San Joaquin River, sufficient water would be obtained from these sources to meet the needs of the developed areas of deficient water supply at a cost less than that from any other source. By this plan the importation of water from the delta of the Sacramento and San Joaquin rivers would not

be required until there was a demand for additional waters to irrigate new lands.

Construction of the San Joaquin River pumping system, therefore, could be deferred. However, it should be included in the plan as an initial unit for the sake of insurance, because a succession of years drier than has been experienced in the past would result in an available supply less than estimated on the basis of the past eight or twelve years and would necessitate installation of the pumping system.

INITIAL PLAN COST

The capital costs of the physical units of the initial plan proposed for the Upper San Joaquin Valley, exclusive of cost of water rights and general expense, are as follows:

<i>Item</i>	<i>Capital cost</i>
Friant dam, reservoir and power plant...	\$15,500,000
San Joaquin River-Kern County Canal (concrete lined)-----	27,300,000
Madera canal (concrete lined)-----	2,500,000
Magunden-Edison pumping system.....	100,000
San Joaquin River pumping system (construction deferred)-----	15,000,000
Sacramento-San Joaquin Delta cross channel (construction deferred)-----	4,000,000
Total -----	\$64,400,000

In making provision for proper utilization of imported water, consideration should be given to the method of distributing both the "in season" water falling within the irrigation demand and the excess flows not within the irrigation demand, both in and out of season, for replenishment of ground water storage. It is proposed that the "in season" water falling within the irrigation demand be supplied to the irrigated lands by means of surface conduits and ditches in accord with the demand for irrigation water. The water outside of the irrigation demand would be introduced underground by application on absorptive lands for irrigation in greater quantities than net use requirements; through seepage losses from unlined canals and ditches, both existing and proposed; through absorption in stream beds of natural channels; and by the construction of spreading works or by other artificial means of accelerating percolation.

The water thus introduced underground would be recovered later by pumping. Areas of ground water storage therefore would require wells and pumping plants as under present conditions of development and utilization of the local water supplies. Under the proposed plan, however, the proportion of the mean annual supply which would be obtained by pumping, as well as the average pumping lift would be materially reduced.

The State's investigation has been made by the Department of Public Works, Colonel Walter E. Garrison, Director, under the general direction of State Engineer Edward Hyatt. The investigations have been outlined and supervised by A. D. Edmonston, Deputy State Engineer, and the investigation for the San Joaquin River Basin has been executed under the immediate direction of A. L. Trowbridge and Gerald H. Jones.

Highway District Engineers Thrash Out 21 Questions at Annual Conference

THE annual conference of District Engineers was held in Sacramento November 12th and 13th, all District Engineers and Departmental heads attending.

These conferences are held at least once each year for the purpose of affording the District Engineers and Departmental heads an opportunity for exchanging ideas on pertinent subjects, thus enabling each to profit by the others experience and also to insure uniformity of practice on common problems.

This year's conference was very successful and it is felt that everyone was benefited by the various discussions. Principal Assistant Engineer G. T. McCoy presided at the meeting. Addresses were made by Director of Public Works Col. Walter E. Garrison, State Highway Engineer C. H. Purcell, and Deputy Director James I. Herz, all of whom expressed appreciation of the problems confronting the District Engineers and gave assurance of their full support.

THOROUGH DISCUSSION

Prior to the meeting the various districts were requested to advise the chairman of any subjects they wished to bring up for discussion. From the suggestions received twenty-one subjects were selected, as indicated below, all of which were thoroughly discussed during the two-day session.

Probably the most mutually beneficial discussion was in regard to contractors' claims. In this discussion Mr. Purcell emphasized the necessity of the districts' foreseeing and keeping complete records regarding contractors' claims in advance of submitting the final estimate to headquarters; also of the absolute necessity for the resident engineer to put his instructions in writing on all matters where claims may ensue.

Another important subject which was clarified was the maintenance of detours, about which there had been apparently some misunderstanding and some little variance in practice among the various districts. It was pointed out that the policy was for the State to maintain existing roads which were used for detouring traffic around highway construction, any excess maintenance to be a part of the construction costs, although the maintenance work would be handled by the regular maintenance forces.

CONTRACTORS' OBLIGATION

In cases where traffic is not detoured, but carried through construction, the maintenance is solely the contractor's obligation until such time as the road is taken over for maintenance by the State. In cases where detours are constructed alongside of going work, the special provisions will govern; however, the usual policy will be for the contractor to construct the detour which will then be maintained by State forces, any excess maintenance cost being chargeable to the construction project.

The question of the possibility of exercising closer control of overbreak by writing into the specifications more definite provisions controlling blasting operations was discussed at length, the suggestion being made that much trouble would be averted by prohibiting the use of the coyote method. However, the

discussion did not bring out sufficient evidence to seemingly justify any changes in the specifications at this time, it being conceded that the present specifications with rigid inspection are generally proving very satisfactory.

Where a contractor opens up operations obviously with the intent of producing the maximum amount of overbreak, he should be informed at the start and in writing as to just what he will be paid for. It was the general feeling that regardless of how the specifications were written, there would be cases of unavoidable overbreak which legitimately should be paid for and that the practicability of any tighter specifications covering this feature is very questionable.

TWENTY-ONE TOPICS

In discussing equipment rental it was decided to reduce the present ten-day minimum monthly rental to five days.

The above are only few of the highlights of the two-day discussion, which included the following twenty-one subjects:

1. Earth work—reasonable policy with respect to allowance for overbreak, slides, excavation outside of authorized line. Methods of determining shrinkage and swell, proper design on marsh land, on mud flats.
 2. Claims on contracts—discussion relative to nature of claims encountered by this department.
 3. Personnel—reclassification, Probst reports, etc.
 4. Vacations and sick leave.
 5. Detours.
 6. Cooperative improvements through towns.
 7. Alien and prevailing wage laws.
 8. Intersections and connecting roads.
 9. Roadside beautification, tree planting, sign removing.
 10. Liability of officials because of defects in roads or structures, because of issuance of permits, etc.
 11. Service agreements—equipment rentals, moving of right of way encroachments, etc.
 12. Materials and research—discussion of studies now being carried on.
 13. Equipment Department—discussion of matters of general nature which may come up.
 14. Bridge Department—status of work and plans.
 15. District coordination in improving secondary roads which traverse more than one district.
 16. Cutback asphalt—oilmix—emulsions.
 17. Bituminous membrane curing.
 18. Rock or oiled shoulders as part of original contract in valley roads.
 19. Right of way.
 20. Standards and economics of highways as now being constructed as to location, cross section, and surfacing.
 21. Revisions in specifications.
- The engineers enjoyed the banquet at the Country Club on Thursday evening at which were present Highway Commissioners Harry A. Hopkins, Philip A. Stanton and Frank A. Tuttle.



THE BIG TEN of highway field executives—the District Engineers of the California Department of Public Works—are shown above as they gathered at headquarters for an annual conference that lasted two days. Seated in the front row from left to right are: State Highway Engineer C. H. Purcell, their chief, and the following District Engineers: Col. John H. Skeggs, San Francisco; S. V. Cortelyou, Los Angeles; L. H. Gibson, San Luis Obispo; C. H. Whitmore, Sacramento; F. W. Haselwood, Eureka; H. S. Comly, Redding; E. E. Wallace, Fresno; E. Q. Sullivan, San Bernardino; R. E. Pierce, Sacramento; F. G. Somner, Bishop. Standing in the rear row from left to right are: G. R. Winslow, Assistant Construction Engineer; J. G. Standley, Staff Engineer; G. T. McCoy, Principal Assistant Engineer; E. W. Withycomb, Assistant Construction Engineer; C. S. Pope, Construction Engineer; F. J. Grumm, Engineer of Surveys and Plans; F. W. Panhorst, Acting Bridge Engineer; R. M. Gillis, Assistant Construction Engineer; T. E. Stanton, Engineer of Materials and Research; J. H. Obermuller, Assistant Engineer of Surveys and Plans; T. H. Dennis, Maintenance Engineer; R. H. Stalnaker, Equipment Engineer; E. R. Higgins, Comptroller, Public Works Department; W. A. Smith and F. E. Quail, Assistant Maintenance Engineers.

Good Roads Boost Gasoline Totals

A striking proof of what good roads have done toward increasing automobile travel is furnished by the latest figures showing that the annual consumption of gasoline is now four times as much as it was ten years ago.

Motorists in California used 1,335,556,000 gallons of gasoline in 1930 as compared to 1,253,337,000 gallons in 1929.

For the country as a whole there were 15,761,400,000 gallons of gasoline consumed by motorists in 1930 as compared with 13,962,120,000 gallons in 1929, an increase of 5.3 per cent.

New York led the states in gasoline consumption last year with a total of 1,511,997,000 gallons, while California was second with a total consumption of 1,335,556,000 gallons.

The annual consumption of gasoline is four times as much as it was ten years ago, although the number of motor vehicles has increased only two and a half times.

\$1,960,500 Budgeted Work Put Underway

The Division of Highways is maintaining the year's record for getting all budgeted work under way. During the last month, construction and maintenance projects set in motion have a cost total of \$1,960,500. The record for the year now stands:

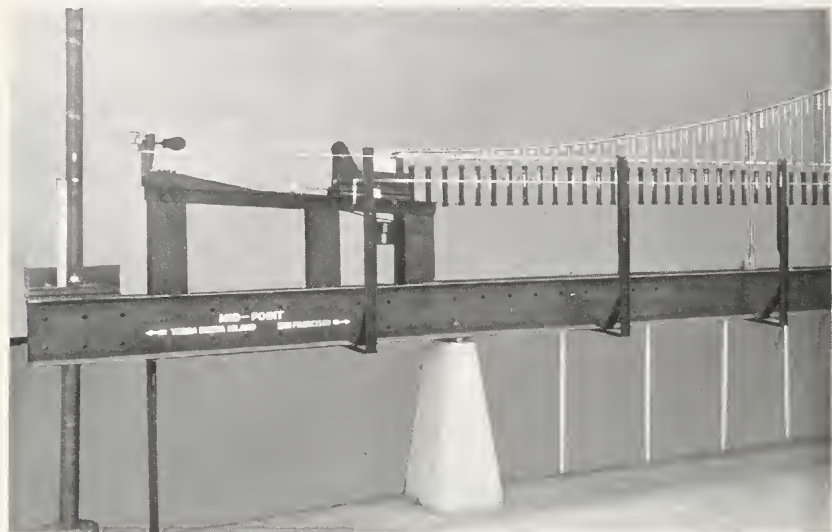
Construction	\$23,355,800
Maintenance	6,460,800
Carried over from 1930	9,402,600

**Total Jan. 1, 1931, to Nov.
20, 1931** \$39,219,200

Since October 23, work orders have been issued to a total of \$1,960,500. Projects advertised amount of \$1,333,600. During the coming month, the program calls for the advertising of construction work estimated to cost \$2,255,400.

"Do you know how to make a peach cordial?"
"Sure. Send her a box of candy."

San Francisco-Oakland Bridge Model



HERE is the first photograph of the model bridge from which designs are being shaped for the mammoth \$75,-000,000 San Francisco-Oakland Bay Bridge.

Built to a scale of one-thousandth the actual size of the bridge to be erected, models have been constructed at the Engineering Department of the University of California at Berkeley by the State Engineers' Department, Professor Davis of the University and his classes.

These models have been put to a series of tests to determine strains and stresses and, from the results noted in these experiments, the engineers will determine upon the type of structure to span San Francisco Bay.

WORK HAS STARTED

Already work on the design of the real structure has started as a result of these experiments. Various plan layouts of that portion that will stretch between Yerba Buena Island and San Francisco are being made and estimates of cost compiled.

Two general plans are being considered; one consisting of two simple suspension spans with a central anchorage, the two main spans

being approximately 2300 feet in length. The other, a single suspension span with a 3800-foot central span.

Preliminary figures indicate that the single suspension span with a 3800-foot central opening would be considerably more expensive and probably more flexible.

General layouts and estimates of these two types of structure are being intensively studied and will be in shape for a decision to be arrived at when the Consulting Board meets again.

MAKING LOAD TESTS

The photograph above, taken by Lawton & McClure of San Francisco, represents one-half the bridge. The weights hanging from the top wires are used to test loads on the top cables. The vertical dotted line carries the roadways and breaks up distortions under load.

Next in order may be seen a string of horizontal black weights. These represent the weight of trusses and roadway. The little white weights at the bottom are hung from pulleys to represent "wind loads." In other

First Photograph of Test Set-up

(Continued from preceding page)



words the effect on the bridge of an 100-mile-an-hour gale has been tested by means of this model.

The heavy solid white verticals represent the towers of the bridge and at the bottom the white pillars may be noted two counter weights which represent the resistance the two towers would have against horizontal deflection at the top.

BORINGS COMPLETED

While these experiments have been taking place, very good progress has been made by the firm of Duncanson-Harrelson Co., in borings in the bay. Three holes have been put down at the second pier off Yerba Buena Island and rock has been encountered from 130 to 140 feet in depth.

Two diamond drill holes are nearly completed just east of the island for the first pier, where rock is encountered at 40 feet.

This work is being carried on as rapidly as possible, the contractor using three continuous shifts and with reasonable weather conditions the borings should be completed by the first of February.

Results of the borings to date indicate a slightly better foundation condition than was anticipated.

CAISSON WORK

It is hoped that the next meeting of the Consulting Board will be called early in January when designs and estimates will be advanced sufficiently, it is believed, to permit of final determination of the plan layouts.

The design and inspection forces now number slightly over fifty engineers who, with the exception of four, are citizens of the State of California.

CYCLIST WANTS TO PAY

A bicycle rider with a conscience so strong that he wants to pay a tax to the state for use of the public highways is reported by Russell Bevans, acting registrar of the Department of Motor Vehicles. C. G. J. Wolfe of Vallejo sent a check for \$1 to Bevans with the explanation that it was "from one who wishes to pay his little bit for benefits received."

Unfortunately for Wolfe's conscience, however, there is no authority in the law to permit acceptance of fees from bicycle riders who use only leg power and Bevans returned the check to him.

Local Water Problems Heard in Detail

(Continued from page 15)

initial plan. E. C. Eaton, Frank Hays, Wm. A. Johnstone and J. L. Matthews participated in the discussion of the State Water Plan and of the local problems of conservation.

On November 4th and 5th a two-day joint session was held in Los Angeles. The following members of the Commission and Committee were in attendance:

COMMISSIONERS

Hon. Matt I. Sullivan, Chairman
James M. Burke
Francis Carr
Shannon Crandall
R. C. Harbison
W. B. Mathews
Jesse Poundstone
A. B. Tarpey

EX OFFICIO MEMBERS

Major A. M. Barton
Colonel Walter E. Garrison
Edward Hyatt, Secretary

MEMBERS OF COMMITTEE

Senator B. S. Crittenden, Chairman
Assemblyman Robert P. Easley
Assemblyman Robert L. Patterson
Senator C. C. Baker
Senator Ralph H. Clock
Senator Frank W. Mixer
Senator W. P. Rich
Senator Andrew R. Schottky
Senator Ralph E. Swing
Assemblyman Edward Craig
Assemblyman Harold C. Cloudman
Assemblyman John E. Frazier
Assemblyman Frank S. Israel
Assemblyman Chester M. Kline

Senator Crittenden presided. The various southern California problems including the Colorado River, the Imperial Valley, Los Angeles County and the Coastal Counties of Ventura, Santa Barbara and San Luis Obispo were discussed by the people of these sections. The meetings were well attended and local conditions explained in detail. Supervisor John R. Quinn of Los Angeles County and E. C. Eaton, chief engineer of the Los Angeles County Flood Control District, presented the conservation and flood control problems of that county.

METROPOLITAN VIEWS

Carl A. Davis, deputy city attorney of Los Angeles, and J. B. Lippincott, consulting engineer, presented various problems of the metropolitan area. C. L. Preisker, chairman of the Board of Supervisors of Santa Barbara

County, John A. Jamison, president of the Montecito Water District, and A. C. Harbison of Ventura County presented the local conditions and problems of the coastal counties.

The Commission and Committee met with the Board of Directors of the Los Angeles Chamber of Commerce at lunch on November 5th and with the Water Committee of the State Chamber of Commerce in the evening. Among the principal speakers at the State Chamber of Commerce meeting were Lieutenant Governor Merriam, A. E. Miot of the Tulare County Board of Trade, S. Parker Frisselle of Fresno, Dr. Grinnell of Montague, Leo Hensel of Imperial, E. N. Richmond of San Jose, Senator Crittenden, chairman of the Legislative Committee and Shannon Crandall, vice chairman of the Governor's Commission.

TOPICS OUTLINED

Harrison S. Robinson, chairman of the Chamber of Commerce Water Committee, presided. He outlined a number of topics pertinent to the State Water Plan and called upon representatives from various parts of the State for discussion. Following this a general discussion of the State Water Problem was held.

This series of meetings brought out several important problems of state-wide interest and showed that a great deal of interest is being taken and much consideration given to the State Water Problem by the citizens of the State. The Committee and Commission secured the viewpoint of many areas regarding the State Water Plan and of the necessity for a coordinated program of conservation.

The California Joint Legislative Water Committee adjourned to meet in San Francisco on November 20th, and the California Water Resources Commission adjourned to meet in San Francisco on November 18th.

His wife: "Well, just look at your flattened derby. What caused that?"

Equipment Salesman: "The depression."

His wife: "Yes? Going to even blame that on depression?"

Equipment Salesman: "The depression is right, and I stick to my story. And here it is. We—or rather, I—was driving along at about fifty miles per hour and along comes a concrete dip, and I and the derby went up faster than the top of the car, and for no other reason than the depression in the highway."—*Texas Highways*.

Gleaned From the Letter Box

The following resolution commending the Division of Highways for the completion of that portion of Route 42 from Saratoga Gap to Waterman Switch was forwarded by the Board of Supervisors of Santa Cruz County:

On motion of Supervisor Pinkham, duly seconded by Supervisor Morgan, the following resolution is adopted:

RESOLUTION

WHEREAS, the building of the State highway on the Saratoga Gap, Big Basin road, between what is known as Waterman Gap and Saratoga Gap, is now completed, and

WHEREAS, the completion of the unit between the said Waterman Gap and Saratoga Gap has greatly relieved the traffic on the Santa Cruz-Los Gatos highway, and

WHEREAS, the completion of the said road is of great benefit not only to the people in the county of Santa Cruz, but also to many thousands of people from surrounding vicinities; therefore be it

RESOLVED, that this Board of Supervisors send a letter of thanks along with a copy of this resolution to John H. Skeggs, the Division Engineer of the California State Highway Department, and to the California State Highway Department; and be it further

RESOLVED, that in the said letter this Board of Supervisors express their thanks for the cooperation of the said John H. Skeggs and the California State Highway Department in completing the said road in such a wonderful manner, and thereby relieving the county of Santa Cruz from a congested traffic situation which was heretofore difficult to handle in order to insure safety to the traveling public.

Passed this 23d day of October, 1931, by the following vote: Ayes: Supervisors Lewis, Morgan, Pinkham, Rostrom and Ley. Noes: None, absent, none.

GEORGE N. LEY,

Chairman of the Board of Supervisors.

Attest: H. E. MILLER,

Clerk of Said Board.

* * * * *

Col. John H. Skeggs, Division Engineer,
State Highway Department,
San Francisco, California.

Dear Sir: We wish to commend the work of A. Walsh, resident engineer, in charge of the construction of the Saratoga Summit to Waterman Gap highway.

We feel that Mr. Walsh managed the construction of the highway very efficiently and we appreciate the consideration he showed us at all times. During the entire job he was courteous and efficient, cooperating with us in every way.

We have heard nothing but commendation of Mr. Walsh, both from those in his employ and those he contacted while the construction was under way. We are extremely proud of this new highway, and we feel that Mr. Walsh had no small part in its early and satisfactory completion.

We congratulate you on having in your employ a man as capable and likeable as Mr. Walsh, and we wish him the utmost success.

Very truly yours,

SAN LORENZO VALLEY CHAMBER
OF COMMERCE.

By (Signed) REBECCA PERDEW,
Secretary.

* * * * *

Mr. Edward Hyatt, State Engineer,
State of California,
Sacramento.

Dear Sir: The undersigned water users of the lower Feather River during July and August of the present season were faced with the shortage of water in the Feather River never before known in California. The Feather River from a short distance below Marysville to the point where it empties into the Sacramento River became entirely dry. Unless water was obtained within a very few days a large acreage of orchards and general farm products which depended on water from the Feather River faced a very serious loss.

We brought the above matter to your attention and you exerted to the utmost not only the prestige and authority as prescribed in the office of the State Engineer, but went considerably beyond that and used your personal connections and friendship to secure additional water for us. Our water shortage was relieved by your securing the release of additional water from the reservoirs of the Pacific Gas and Electric Company and a curtailment on the part of some of the larger users on the river above us.

We, as the chief beneficiaries of your very excellent services rendered at this time, wish to express to you our appreciation of your very fine work and your broad conception of the duties of your office in coming to our rescue.

Very sincerely yours,

GEO. G. POLLOCK.
SUTTER INVESTMENT CO.,
By J. C. BOYD, President.

BROWN & PURINTON,
By E. S. BROWN.

FARM LAND INV. CO.,
By J. W. LUCOR.

SUTTER BASIN CORPORATION, LTD.,
By EDW. SCHRANZ, JR., President.

RIDE IN CAR, NOT ON IT

Automobiles are built to ride in, not on, says a warning from the National Safety Council. Adults usually show better sense, but schools boys, (and some girls too) seem to think that even if a car is filled up, it will carry a few more on the running board, the spare tire, or the bumpers. The danger is apparent. In their merriment they may loose their hold. Bumps and ruts may cause them to fall off. Tire carriers or bumpers may break. It is a mighty dangerous way to travel.

California Highway Commission Policy Told to State Chamber of Commerce

Among the speakers at the annual meeting of the State Chamber of Commerce at Los Angeles, November 5th, was Earl Lee Kelly of Redding, Chairman of the California Highway Commission. Tracing the development of the State from the first pioneers of the covered wagon period and the winding trails of the padres into a mighty empire of six million people with 20,000 miles of paved highways, Mr. Kelly devoted a portion of his speech to the general policy of the Highway Commission, as reproduced in the following article:

By **EARL LEE KELLY**, Chairman California Highway Commission

I THINK for a moment I would like to dwell upon four of the important or major points in the policy of Governor Rolph's Highway Commission.

First—Our ten-year program.

Second—The orderly addition of roads to the state highway system.

Third—Cooperative construction with towns and cities.

Fourth—Increasing the safety of our state highways.

First, the ten-year program. A study of what our State highway problems during the next ten years will be has just been completed, including a thorough investigation of the following:

A complete traffic count has been made as well as an estimate of the traffic which will develop during the next ten years, including both volume and kind. Having in mind the traffic which will develop during this period, a study of the entire State highway system has now been completed and improvements planned which will have to be made during such time to adequately carry traffic.

Estimates were prepared for the improvements so that a good idea of the costs during the next ten years is known. An estimate of the revenue for State highway purposes to be anticipated during this period based on present laws has been made. In preparing the biennial budget for the construction and improvement of the State highway system, the California Highway Commission and the Department of Public Works are guided by the information gathered in this study. Every budget is a forward step in developing the entire highway system of California.

Addition of Roads to the State System

In line with instructions from the Legislature and in accordance with the policy of



EARL LEE KELLY

Governor Rolph an engineering and economic study is now under way of roads which appear to be eligible for inclusion into the State highway system. The roads recommended to the Legislature for inclusion will be selected only after a thorough study of the entire State has been made.

By following this policy roads will be added to the State highway system on the basis of the most good to all the people of the state and not for political reasons. Our State highway system will be gradually

More Safety Being Built Into Highways All Over the State

expanded to serve on an equal basis all of the people of all of California.

Cooperation with Cities.

The present administration has adopted the policy of cooperating with cities and towns in the improving of streets which are on the routes of State highways through the towns and cities. During the present biennium the Commission has under way or under negotiations cooperative projects with thirty-six cities and towns located all over the State with a total of \$2,554,000 as the value of the State's share of the work.

Increasing Safety Factors

With increasing volume of traffic and the tendency toward higher speeds, the necessity for building safety into the highways is becoming more and more pronounced. With this in mind the department is emphasizing better and more uniform alignment, ample shoulders along the pavements (8-foot shoulder on our trunk roads and as much as possible on mountain roads) widening and super-elevating the pavement on curves, non-skid surfaces on pavement, marking traffic lanes and installing guard rails, etc.

In conclusion, we should be ever watchful that the revenues of the State highway system shall not be diverted to other than highway uses. Fairness to the motorist requires this and fairness to the State highway system itself makes the same demand. If these revenues are not so protected the completion of our State highway system will be delayed for many years to the consequent injury of the entire State of California.

ARCHITECTURAL AWARDS

For Month of October

California School for Deaf, Berkeley—Primary School Building and Academic Dining Hall: for general work awarded to K. E. Parker Co., San Francisco, \$162,000; for plumbing work to Mechanical Contracting Company, San Francisco, \$8,360; for heating and ventilating work, to Alta Electric and Mechanical Co., San Francisco, \$16,960; for electrical work, to Alta Electric Mechanical Co., San Francisco, \$14,485.

Border Inspection Station, Department of Agriculture, Hornbrook: for complete construction to T. B. Goodwin, San Francisco, \$7,764.

Norwalk State Hospital—Installation of water pipe line to Johnson and Reeves, Glendale, \$7,631.

Preston School of Industry, Lone—Installation of penstock line to California Corrugated Culvert Co., \$22,837.

Maintenance Crews Keep Donner Pass Open Despite Snow

THE first heavy snow fall of the season in the Donner Summit region of the Sierra that started about 2 a.m. Saturday morning, November 14th, found the Maintenance Department of the Division of Highways well equipped for handling snow removal work between Colfax and the State line. At Colfax there are stationed two trucks equipped with straight push plows and one tractor grader with blade and "V" plow. This equipment handles the section from Colfax to Airport and also any necessary work west to Auburn.

For the section from Airport to Donner Lake two Maintenance Stations are maintained, one at Yuba Pass and one at Donner Summit. Nine snow plows operate between these two points. These units consist of heavy trucks, four being mounted with straight blade push plows, two with "V" type push plows, two of the auger blower type units, and one rotary shovel type.

WORK PROMPTLY BEGUN

At Truckee there are two straight blade plows mounted on trucks and one rotary shovel type.

As soon as word was received that snow was falling the organization was assembled and work started. The Donner Summit road was open to through traffic Sunday morning—full two-way width maintained. The snow fall there was 2½ feet in the first storm and increased to 54 inches in the following three days. The road was closed Sunday night and again at intervals during the storm as a measure of safety and to permit maintenance crews to work.

The department urgently advises motorists not to attempt to use the pass roads unless equipped with chains. Although the snow is cleared away low temperatures produce an icy, slippery road surface. Cars without chains are turned back by Motor Patrol officers.

It is the intention to start work with the beginning of each storm, and open up the road as soon as possible after the storm ceases. Gates are in place at Airport and at Truckee, and as soon as storm conditions prevail these gates are closed and watchmen placed on duty.

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

LASSEN COUNTY—Ridenour Dam No. 259. S. D. Ridenour, Susanville, owner; earth, 17 feet above streambed with a storage capacity of 50 acre-feet, situated on unnamed drainage tributary to Susan River in Sec. 17, T. 29 S., R. 12 E., M. D. B. and M. For storage purposes, for irrigation and stock use.

MODOC COUNTY—McBrien Lake Dam No. 152-7. R. Lindauer, Alturas, owner; earth dam, 5 feet above streambed, situated on small ravine tributary to Pit River in Sec. 22, T. 42 N., R. 11 E., M. D. B. and M. For storage purposes, for irrigation use.

SANTA CRUZ COUNTY—Cowell Reservoir No. 23. City of Santa Cruz, Santa Cruz, owner; earth dam, 41 feet above streambed, High Street, City of Santa Cruz. For storage purposes, for municipal use.

SANTA CRUZ COUNTY—Bay St. Reservoir No. 23-2. City of Santa Cruz, Santa Cruz, owner; earth, 21 feet above streambed with a storage capacity of 117 acre-feet, located at Bay Street and Meder Street. For storage purposes, for municipal use.

MODOC COUNTY—Shelton Dam No. 170. A. A. Curtis, Canby, owner; flashboards, situated on Pit River tributary to Sacramento River in Sec. 36, T. 42 N., R. 9 E., M. D. B. and M. For diversion purposes, for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of October, 1931.

LOS ANGELES COUNTY—San Gabriel Dam No. 2, 32-5. Los Angeles County Flood Control District, Los Angeles, owner; rockfill, 250 feet above streambed with a storage capacity of 14,000 acre-feet, situated on West Fork San Gabriel Canyon tributary to San Gabriel River in Section 19, T. 2 N., R. 10 W., S. B. B. and M. For storage purposes, for flood control use. Estimated cost \$1,800,000, fees paid \$6,300.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of October, 1931.

NAPA COUNTY—Lake Marie Dam No. 1-6. Napa State Hospital, Imola, owner; earth, situated on Tulocay Creek tributary to Napa River in Sec. 19, T. 5 N., R. 3 W., M. D. B. and M.

SAN MATEO COUNTY—Dennis Martin Dam No. 610. A. Schilling, Redwood City, owner; earth, situated on Dennis Martin Creek tributary to San Francisco Creek and El Corte Madera Ranch.

SAN JOAQUIN COUNTY—Davis Dam No. 572. Ferroggiaro and Podesta, Linden, owner; earth, situated on Shaw Creek tributary to Calaveras River in Sec. 6, T. 2 N., R. 3 E., M. D. B. and M.

PLUMAS COUNTY—Grass Lake Dam No. 284. Carnation Gold Mining Company, Blairsden, owner; earth, situated on Little Jamison Creek tributary to Jamison Creek in Sec. 36, T. 22 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Big Sage Dam No. 55. Hot Spring Valley Irrigation District, Alturas, owner; earth, situated on Rattle Snake Creek tributary to Pit River in Sec. 1, T. 41 N., R. 13 E., M. D. B. and M.

CONTRA COSTA COUNTY—Mt. Diablo Country Club Dam No. 583-2. Mt. Diablo Country Club, Diablo, owner; earth, situated on unnamed creek tributary to Green Valley Creek in Sec. 14, T. 1 S., R. 1 W., M. D. B. and M.

SONOMA COUNTY—Lake Ralphine Dam No. 422. Santa Rosa Water Works, Santa Rosa, owner; earth, located in T. 7 N., R. 7 W., M. D. B. and M.

MODOC COUNTY—McBrien River Dam No. 152-6. R. Lindauer, Alturas, owner; flashboards, situated on Pit River tributary to Sacramento in Sec. 16, T. 42 N., R. 11 E., M. D. B. and M.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86. Pacific Gas and Electric Company, owner; earth, 6 feet above streambed with a storage capacity of 400 acre-feet, situated on North Cow Creek tributary to Sacramento River in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M. For storage purposes, for power use.

SANTA CLARA COUNTY—Lake Ranch Dam No. 622. San Jose Water Works, San Jose, owner; earth, situated on Beardsley Creek tributary to Los Gatos Creek in Sec. 23, T. 8 S., R. 2 W., M. D. B. and M.

SANTA CLARA COUNTY—Upper Howell Dam No. 622-3. San Jose Water Works, San Jose, owner; earth, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

MODOC COUNTY—Caldwell Upper Pit Dam No. 156-5. G. L. Kramer, Bieber, owner; crib, situated on Pit River tributary to Sacramento River in Sec. 34, T. 42 N., R. 10 E., M. D. B. and M.

MENDOCINO COUNTY—Mendocino Middle Dam No. 1-3. Mendocino State Hospital, Talmage, owner; gravity, situated on Mill Creek tributary to Russian River in Sec. 31, T. 15 N., R. 11 W., M. D. B. and M.

LOS ANGELES COUNTY—Greenleaf Reservoir No. 18. City of Whittier, Whittier, owner; earth, situated on tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. B. and M.

SONOMA COUNTY—Lawler Dam No. 581-3. California Water Service Company, San Francisco, owner; earth, situated on Adobe Creek tributary to Petaluma Creek in Sec. 12, T. 5 N., R. 7 W., M. D. B. and M.

MODOC COUNTY—Shelton Dam No. 170. A. A. Curtis, Canby, owner; flashboards, situated on Pit River tributary to Sacramento, in Sec. 36, T. 42 N., R. 9 E., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

TUOLUMNE COUNTY—Biglow Lake Dam No. 550. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed with a storage capacity of 460 acre-feet; situated on East Fork Cherry River tributary to Tuolumne River in Sec. 35, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Buck Lake Dam No. 550-2. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed, situated on Buck Meadows Creek tributary to W. Fork Cherry Creek in Sec. 24, T. 4 N., R. 20 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Emigrant Lake Dam No. 550-3. Tuolumne County, Sonora, owner; gravity, 7 feet above streambed with a storage capacity of 1491 acre-feet, situated on North Fork Cherry Creek tributary to Tuolumne River in Sec. 30, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Upper Emigrant Lake Dam No. 550-4. Tuolumne County, Sonora, owner, gravity 8 feet above streambed with a storage capacity of 160 acre-feet, situated on North Fork Cherry Creek tributary to Tuolumne River in Sec. 11, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Long Lake Dam No. 550-5. Tuolumne County, Sonora, owner; gravity, 3 feet above streambed with a storage capacity of 520 acre-feet, situated on West Fork Cherry Creek, tributary to Tuolumne River. For storage purposes, for fish conservation use.

LOS ANGELES COUNTY—Bouquet Canyon Dam No. 6-31. City of Los Angeles, Los Angeles, owner; earth, 170 feet above streambed with a storage capacity of 36,200 acre-feet, situated on Bouquet Creek tributary to Santa Clara River in Sec. 29, T. 6 N., R. 14 W., S. B. B. and M. For storage purposes, for municipal use.

\$6,916,996 for Southern Counties

Highway improvements totaling close to seven million dollars are scheduled for Southern California, all of which will be advertised for bids prior to April 1, 1932. This announcement was made in the report of the Department of Public Works presented at the Governor's Council meeting of November 24th. The projects which include grading, paving, widening, surfacing operation and bridge construction are as follows:

Description	Miles	Type	Amount
Carlsbad to Oceanside.....	0.3	Grade	\$5,300
Tecate Divide to Boulder Park....	14.6	Gr. and P. C. C. Pave.	440,000
Coyote Wells to Dixieland.....	14.7	Gr. and A. C. Pave	598,000
Cambria to San Simeon.....	8.6	Gr. and Surf.	210,000
Los Alamos Creek Bridge.....		Bridge	31,000
Plaza Garage Grade Separation....			50,000
Lemon Cove to Three Rivers.....	10.6	Gr. and Surf.	350,000
Grapevine Sta. to 3 miles south....	3.0	Gr. and Pave	520,000
Plaza Garage to Goshen and Plaza			
Garage to 0.3 of a mile westerly....	5.8	Gr. and Pave.	272,000
Las Flores Canyon to Santa Ynez..	7.4	Gr. and Pave.	294,400
Dana Point to Laguna Beach.....	5.6	Gr. and Pave.	470,000
Irvine to Tustin.....	5.7	Widen Pave.	184,096
Newport to Corona Del Mar.....	3.7	Gr. and Pave.	203,233
El Cajon to Las Coches Cr., portions	3.5	Gr. and Pave.	191,566
Oxnard to El Rio.....	1.1	Widen Pave.	26,400
Tujunga to La Canada.....	5.0	Gr. and Bridges	127,000
Canton Creek to Piru Creek.....		Bridges	492,103
San Diego to Oceanside.....	2.9	Pave. Exceptions	87,000
Ventura to El Rio.....	4.5	Gr. and Pave	100,000
Baker east 10 miles.....	10.0	Gr. and Surf.	334,498
Mecca-Blythe Road, portions.....	16.0	Gr. and Surf.	700,000
West entrance to San Bernardino..		Gr. and Pave.	150,000
6 mi. N. Imperial Co. line to Av. 62	8.3	Gr. and Pave.	481,400
Imperial Co. line to 6 mi. north....	6.0	Gr. and Pave.	390,000
Sepulveda Blvd. to Calabasas.....	10.5	Pave.	209,000

Total \$6,916,996

TRAFFIC SHOWS INCREASE

An increase of 1.9 per cent in the number of vehicles using the Minnesota trunk highways, is shown by the annual traffic census taken by the Minnesota highway department. Although the increase is not as large as in some years, Commissioner C. M. Babcock says it indicates that Minnesota is in better shape than some other states that have shown a decrease in their traffic counts.

DIDN'T GO OVER

She—You never hear of women cashiers running off with their employer's money.

He—Not often, but when it does happen they take the employer, too.—*Gridley Daily Globe*.

PREVENTION PAYS

W. H. Cameron, managing director of the National Safety Council, recently pointed out that the strength of the organized safety movement in the United States lies in the fact that "it is cheaper to prevent an accident than to pay for it."

As a rule, we look on accident prevention activity as being a humanitarian work—as a saver of lives. And that, of course, is the first need. But it likewise pays for itself, time and again, in plain dollars and cents.

How much time elapses between the changing of a traffic light from red to green and the honking of the horn in the car behind you? Figure in fractions of seconds.—*Judge*.

October Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of October, 1931.

MENDOCINO COUNTY—Application 7086. State of California, Department of Public Works, Division of Highways, c/o C. H. Purcell, State Highway Engineer, Public Works Building, Sacramento, California, for 500 gallons per day from unnamed spring tributary to South Fork of Eel River. To be diverted in Sec. 20, T. 24 N., R. 17 W., M. D. E. and M., for recreational purposes. Estimated cost \$250.

FRESNO COUNTY—Application 7087. Consolidated Irrigation District, c/o A. R. Stedman, Secretary, P. O. Box 638, Selma, California, for 5000 c. f. s. from San Joaquin River tributary to San Francisco Bay. To be diverted in Sec. 5, T. 11 S., R. 21 E., M. D. B. and M., for power purposes (148,000 H. P.). Estimated cost \$10,000,000.

SHASTA COUNTY—Application 7088. O. R. Smith, R. F. D. No. 1, Gerber, California, for 1000 acre-feet per annum from North Digger Creek tributary to Battle Creek, thence Sacramento River. To be diverted in Sec. 25, T. 30 N., R. 3 E., M. D. B. and M., for irrigation purposes (622.5 acres). Estimated cost \$60.

VENTURA COUNTY—Application 7089. Evelyn Akin Robertson, Box 997, Ventura, California, for 0.35 c. f. s. from unnamed spring tributary to Cuyama River. To be diverted in Sec. 12, T. 7 N., R. 24 W., S. B. E. and M., for irrigation and domestic purposes (10 acres). Estimated cost \$300.

CALAVERAS COUNTY—Application 7090. Harry D. Thompson, c/o Virgil M. Airola, Attorney, Whitlock Building, San Andreas, California, for 1000 gallons per day from Thompson Spring (developed by applicant). To be diverted in Sec. 6, T. 4 N., R. 13 E., M. D. B. and M., for irrigation and domestic purposes (1 acre). Estimated cost \$200.

HUMBOLDT COUNTY—Application 7091. John W. Bergin, Weaverville, California, for 150 c. f. s. from Willow Creek tributary to Trinity River. To be diverted in Sec. 14, T. 6 N., R. 4 E., H. B. B. and M., for mining purposes. Estimated cost \$150,000.

EL DORADO COUNTY—Application 7092. B. W. Stone, 161 Ellis Street, San Francisco, California, for total of 500 c. f. s. and 125,000 acre-feet per annum from (1) Rubicon River (2) Pilot Creek (3) Gerle Creek (4) Loon Lake (5) Buck Island Lake (6) Rock Bound Lake (7) Little South Fork of Rubicon River tributary to American River Drainage. To be diverted in Sec. 9, T. 13 N., R. 16 E., M. D. B. and M.; Sec. 11, T. 12 N., R. 12 E., M. D. B. and M.; Sec. 24, T. 13 N., R. 13 E., M. D. B. and M.; Secs. 1, 31 and 34, T. 14 N., R. 14 E., M. D. B. and M.; Sec. 4, T. 13 N., R. 15 E., M. D. B. and M.; and Sec. 2, T. 13 N., R. 14 E., M. D. B. and M., for municipal purposes.

PLACER COUNTY—Application 7093. C. T. Horgan, 574 47th Street, Oakland, California, for 2 c. f. s. from unnamed stream tributary to Middle Fork of American River. To be diverted in Sec. 8, T. 13 N., R. 10 E., M. D. B. and M., for irrigation purposes and domestic purposes (160 acres). Estimated cost \$500.

DEL NORTE COUNTY—Application 7094. H. L. Hawkins and Lee Brown, c/o H. L. Hawkins, 981 2d Street, Crescent City, California, for c. f. s. from Diamond Creek tributary to North Fork of Smith River. To be diverted in Section 11, T. 18 N., R. 2 E., H. B. and M., for mining and domestic purposes. Estimated cost \$20.

MENDOCINO COUNTY—Application 7095. W. M. Yorgason, Fort Bragg, California, for 4 miners inches from South Fork of Digger Creek tributary to Digger Creek, thence Pacific Ocean. To be diverted in Sec. 19, T. 18 N., R. 17 W., M. D. B. and M., for irrigation and domestic purposes ($\frac{1}{2}$ acre).

PLACER COUNTY—Application 7096. Carrie A. Gladding, Lincoln, California, for 3 c. f. s. and 200 acre-feet per annum from Cook Creek tributary to Feather River. To be diverted in Sec. 22, T. 13 N., R. 6 E., M. D. B. and M., for irrigation and domestic purposes (400 acres). Estimated cost \$4,000.

MONO COUNTY—Application 7097. Lucile E. Bogard, Hawthorne, Nevada, for 1.0 c. f. s. from unnamed springs tributary to Mono Lake. To be

diverted in Section 20, T. 3 N., R. 26 E., M. D. B. and M., for mining and domestic purposes.

MONO COUNTY—Application 7098. Lucile E. Bogard, Hawthorne, Nevada, for 1.0 c. f. s. from unnamed springs tributary to Mono Lake. To be diverted in Sec. 28, T. 3 N., R. 26 E., M. D. B. and M., for mining and domestic purposes.

SANTA CLARA COUNTY—Application 7099. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 200 c. f. s. and 60,000 acre-feet per annum from Coyote River, tributary to San Francisco Bay. To be diverted in Sec. 10, T. 9 S., R. 3 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$1,600,000.

SANTA CLARA COUNTY—Application 7100. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 30 c. f. s. and 9000 acre-feet per annum from Arroyo Calero River, tributary to Alamos Creek. To be diverted in Sec. 31, T. 9 S., R. 2 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$380,000.

SANTA CLARA COUNTY—Application 7101. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 30 c. f. s. and 2500 acre-feet per annum from Almaden Creek tributary to Alamos and Guadalupe Creek. To be diverted in Section 10, T. 9 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres).

SANTA CLARA COUNTY—Application 7102. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 15 c. f. s. and 100 acre-feet per annum from Guadalupe Creek tributary to San Francisco Bay. To be diverted in Sec. 9, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (123,000 acres). Estimated cost \$53,500.

SANTA CLARA COUNTY—Application 7103. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 50 c. f. s. and 3,500 acre-feet per annum from Guadalupe Creek tributary to San Francisco Bay. To be diverted in Sec. 19, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$377,170.

SANTA CLARA COUNTY—Application 7104. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 50 c. f. s. and 4,000 acre-feet per annum from Stevens Creek tributary to San Francisco Bay. To be diverted in Sec. 27, T. 7 S., R. 2 W., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$350,000.

SISKIYOU COUNTY—Application 7105. Harry D. Maltis, Costella, California, for 1.0 c. f. s. from Cole Creek, tributary to South Fork of Indian Creek. To be diverted in Sec. 10, T. 17 N., R. 6 E., H. M., for mining and domestic purposes. Estimated cost \$20.

TUOLUMNE COUNTY—Application 7106. United States-Stanislus National Forest, Sonoma, California, for (1) 360 acre-feet per annum from Lower Buck Lake; (2) 520 acre-feet per annum from Long Lake; (3) 160 acre-feet per annum from Emigrant Meadow Lake; (4) 1491 acre-feet per annum from Emigrant Lake; and (5) 460 acre-feet per annum from Bigelow Lake tributary to Tuolumne River Watershed. To be diverted in Secs. (1) 26 and (2) 27, T. 4 N., R. 20 E., M. D. B. and M. and Secs. (3) 10, (4) 30 and (5) 35, T. 4 N., R. 21 E., M. D. B. and M., for maintenance of fish life and other recreational purposes.

LOS ANGELES COUNTY—Application 7107. H. H. Townsend, 6039 Hollywood Boulevard, Los Angeles, California, for 0.001 c. f. s. from unnamed spring tributary to Piru Creek. To be diverted in Sec. 19, T. 6 N., R. 17 W., S. B. B. and M., for domestic and stock raising purposes.

LAKE COUNTY—Application 7108. Elizabeth M. Robinson, c/o Chas. S. Gilmore, Attorney, Capital National Bank Building, Sacramento, California, for 0.10 c. f. s. from unnamed spring tributary to Clear Lake. To be diverted in Section 32, T. 15 N., R. 8 W., M. D. B. and M., for irrigation and domestic purposes.

Applications and Permits Granted

(Continued from preceding page)

ORANGE COUNTY—Application 7109. United States, Cleveland National Forest, 310 Federal Building, San Diego, California, for 0.003 c. f. s. from San Juan Creek tributary to Pacific Ocean. To be diverted in Sec. 3, T. 7 S., R. 6 W., S. B. E. and M., for domestic purposes. Estimated cost \$500.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of October, 1931.

SUTTER COUNTY—Permit 3793, Application 6892. Andreas C. H. Smith, Yuba City, Sutter County, California, October 3, 1931, for 1.10 c. f. s. from Feather River in Sec. 11, T. 14 N., R. 3 E., M. D. B. and M., for irrigation of 81.65 acres. Estimated cost \$1,500.

STANISLAUS COUNTY—Permit 3794, Application 6894. E. B. Henry, Route 3, Box 947, Modesto, California, October 5, 1931, for 0.70 c. f. s. from Tuolumne River, tributary of San Joaquin River in Sec. 7, T. 4 S., R. 8 E., M. D. B. and M., for domestic use and the irrigation of 58 acres. Estimated cost \$1,000.

BUTTE COUNTY—Permit 3795, Application 6887. Shelley E. Lee, Box C, Biggs, Calif., October 5, 1931, 3.00 c. f. s. from Lateral "A" Reclamation District 833 tributary to Butte Creek and Sacramento River in Sec. 18, T. 18 N., R. 2 E., M. D. B. and M., for the irrigation of 130.9 acres.

BUTTE COUNTY—Permit 3796, Application 6905. California Mutual Building and Loan Association of San Jose, California, October 5, 1931, for 14.78 c. f. s. from Lateral "A" Drainage Canal of Reclamation District No. 833 in Sec. 19, T. 18 N., R. 2 E., M. D. B. and M., for the irrigation of 591.2 acres.

EL DORADO COUNTY—Permit 3797, Application 6999. R. P. Easley et al., Antioch, Calif., October 7, 1931, for 800 gal. per day from an unnamed stream tributary to South Fork American River in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes at four lots. Estimated cost \$500.

EL DORADO COUNTY—Permit 3798, Application 7028. Lawrence B. Kinnear, 309 4th Street, Antioch, Calif., October 7, 1931, for 200 gal. per day from an unnamed stream tributary to South Fork American River in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

EL DORADO COUNTY—Permit 3799, Application 7036. George W. Harter and Mrs. W. W. Belshaw of Antioch, Calif., October 7, 1931, for 400 gals. per day from a spring tributary to South Fork American River in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes.

SIERRA COUNTY—Permit 3800, Application 6600. E. A. Humphreys, c/o R. F. Taylor, Downsville, Calif., October 7, 1931, for 25.00 c. f. s. from South Fork of North Fork of Yuba River, in Sec. 30, T. 20 N., R. 12 E., M. D. B. and M., for mining purposes. Estimated cost \$5,000.

SAN JOAQUIN COUNTY—Permit 3801, Application 6877. J. L. Blossom, and F. M. Lamb, c/o Ohm & Raab, 109 Weber Ave., Stockton, Calif., October 7, 1931, for 15.15 c. f. s. from North Canal tributary to Middle Branch of San Joaquin River in Sec. 35, T. 1 N., R. 4 E., M. D. B. and M., for irrigation of 1212.6 acres. Estimated cost \$14,000.

SUTTER COUNTY—Permit 3802, Application 6933. D. C. Smith, Meridian, Calif., October 7, 1931, for 3.00 c. f. s. from Butte Slough in Sec. 36, T. 16 N., R. 1 W., M. D. B. and M., for the irrigation of 238 acres. Estimated cost \$1,200.

BUTTE COUNTY—Permit 3803, Application 6945. K. Jacobsen, Gridley, Calif., October 8, 1931, for 3.00 c. f. s. from Main Drain of Reclamation District No. 2954 tributary to Sacramento River in Secs. 16 and 21, T. 17 N., R. 2 E., M. D. B. and M., for the irrigation of 632 acres. Estimated cost \$300.

TRINITY COUNTY—Permit 3804, Application 6978. Edward L. Schreckengost, Douglas City, Calif., October 8, 1931, for 2.00 c. f. s. from Brown Creek tributary to Trinity River in Section 18, T. 31 N., R. 9 W., M. D. B. and M., for mining purposes. Estimated cost \$600.

PLUMAS COUNTY—Permit 3805, Application 6996. Wm. Rutherford et al., c/o Wm. Rutherford, P. O. Box 288, Sacramento, Calif., October 8, 1931, for

0.10 c. f. s. and 9 acre-feet from unnamed stream tributary to Middle Fork Feather River in Sec. 16, T. 23 N., R. 7 E., M. D. B. and M., for mining and domestic purposes.

EL DORADO COUNTY—Permit 3806, Application 7013. Edward J. Schoenbacher, 3557 Folsom Blvd., and Frank J. Marry, 640 36th Street, Sacramento, Calif., October 8, 1931, for 400 gals. per day from Bull Creek tributary to South Fork American River in Sec. 29, T. 11 N., R. 14 E., M. D. B. and M., for domestic purposes.

SAN JOAQUIN COUNTY—Permit 3807, Application 6936. O. C. Cutts, Stockton, Calif., October 9, 1931, for 1.00 c. f. s. from San Joaquin River in Sec. 21, T. 1 N., R. 6 E., M. D. B. and M., for the irrigation of 79 acres. Estimated cost \$10,000.

EL DORADO COUNTY—Permit 3808, Application 7018. Mrs. B. M. Fountain, 2901 I Street, Sacramento, Calif., October 9, 1931, for 400 gals. per day from a spring tributary to South Fork American River in Sec. 23, T. 11 N., R. 15 E., M. D. B. and M., for domestic purposes. Estimated cost \$50.

TRINITY COUNTY—Permit 3809, Application 6982. Basil Froloff, Weaverville, Calif., October 9, 1931, for 12.50 c. f. s. from Rush Creek tributary to Trinity River in Sec. 21, T. 34 N., R. 9 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$50.

MONO COUNTY—Permit 3810, Application 6961. Rex M. Foster, Bridgeport, Calif., October 23, 1931, for 0.11 c. f. s. from Spring Creek tributary to Green Creek in Sec. 23, T. 3 N., R. 24 E., M. D. B. and M., for power purposes. Estimated cost \$25.

TRINITY COUNTY—Permit 3811, Application 6946. Trinity Placer Corporation Ltd., Los Angeles, Calif., October 26, 1931, for 100.00 c. f. s. from Soldier Creek, Fork of Soldier Creek, tributary to Trinity River in Sec. 25, T. 33 N., R. 11 W., M. D. B. and M., for mining and domestic purposes.

In Memoriam

CLIFFORD K. ALDRICH, Division of Architecture, received injuries in an automobile accident August 20, 1931, resulting in his death on August 22, 1931.

The deceased was born in 1881 in Creston, Iowa, where he lived and received his early education. After finishing high school, Mr. Aldrich completed his education at the Iowa State College, Chicago School of Architecture, Armour Institute and Art Institute receiving his degree in Architecture in 1903. He was a certified architect in California and a member of the American Institute of Architects.

Mr. Aldrich entered the service of the State of California with the Division of Architecture in 1908 and served well in various capacities until his death, at which time he was Superintendent of Building Construction at the California Polytechnic School, San Luis Obispo.

RAYMOND W. ZEHRING, draftsman in the office of District VII, Division of Highways, since June, 1931, and formerly employed as draftsman in the office of District III, died suddenly on October 13, 1931, of apoplexy while attending Reserve Officers' Training Camp at Monterey.

Longest Concrete Arch in State Among Carmel Coast Link Bridges

By JAMES GALLAGHER, Assistant Bridge Engineer

THE CALIFORNIA coast extending south from Carmel to the Big Sur is one of the most rugged and scenic bits of coastline in the State. It is a stretch of precipitous cliffs and bold headlands broken by deep gorges and inlets of the sea.

The building of this thirty mile section of the Coast Highway, known as State Highway Route No. 56 involves heavy construction and a number of bridge structures, one of which will have the longest concrete span in California.

Two of these bridges, the Garrapata Creek and Granite Creek are the first to be completed of five arch structures to be built during the present biennium.

Garrapata Creek Bridge was completed in November and is now open to traffic. The Granite Creek Bridge is scheduled for completion the middle of February but the contractor is well ahead of schedule and it is expected the bridge will be finished about the first of the year.

SPANS CREEK GORGE

The highway crosses Garrapata Creek thirteen miles south of Carmel. The creek is in a deep gorge extending inland 1000 feet or more from the ocean. The new bridge over this creek is an open spandrel reinforced concrete arch, span one hundred and fifty feet, with one twenty-five foot girder approach span on the north end and four twenty-five foot girder spans on the south.

The total length of the bridge is 285 feet and width of roadway 24 feet. The height of the roadway above the creek bed is about 85 feet. This new concrete bridge replaces an old narrow steel bridge which had become so badly rusted, due to its proximity to the ocean, that it was no longer safe for use and during the past year traffic has been detoured over a small temporary timber bridge at the head of the gorge.

OVER THE SEA

Granite Creek, eleven miles south of Carmel, is a small stream emptying into a narrow rocky ocean inlet. The steep sides of the inlet are granite into which caves have been eroded by the ocean waves. The center line of the highway crosses the head of this

inlet so that the sea will dash under the new bridge.

This reinforced concrete structure has an arch span of 120 feet with two 36-foot girder approach spans on the north and two 44-foot girder spans on the south. The total length of the bridge is 288 feet. The width of roadway is 24 feet. It is more than 100 feet from the level of the roadway to the bottom of the inlet.

This bridge is built on a horizontal curve of 4000 feet radius. The approach grades are 2½ per cent and 3 per cent connected by a 200 foot vertical curve. The old highway here winds up one side of the canyon and back on the other side with sharp turns and steep grades crossing the creek with only a small one span timber bridge.

Garrapata Creek Bridge was built by Hanrahan Company of San Francisco at a cost of approximately \$35,500, excluding approach grading. O. R. Bosso was resident engineer.

Granite Creek Bridge is being built by Geo. J. Ulrich Construction Company of Modesto, at a cost of \$33,700. W. E. Sutton is resident engineer.

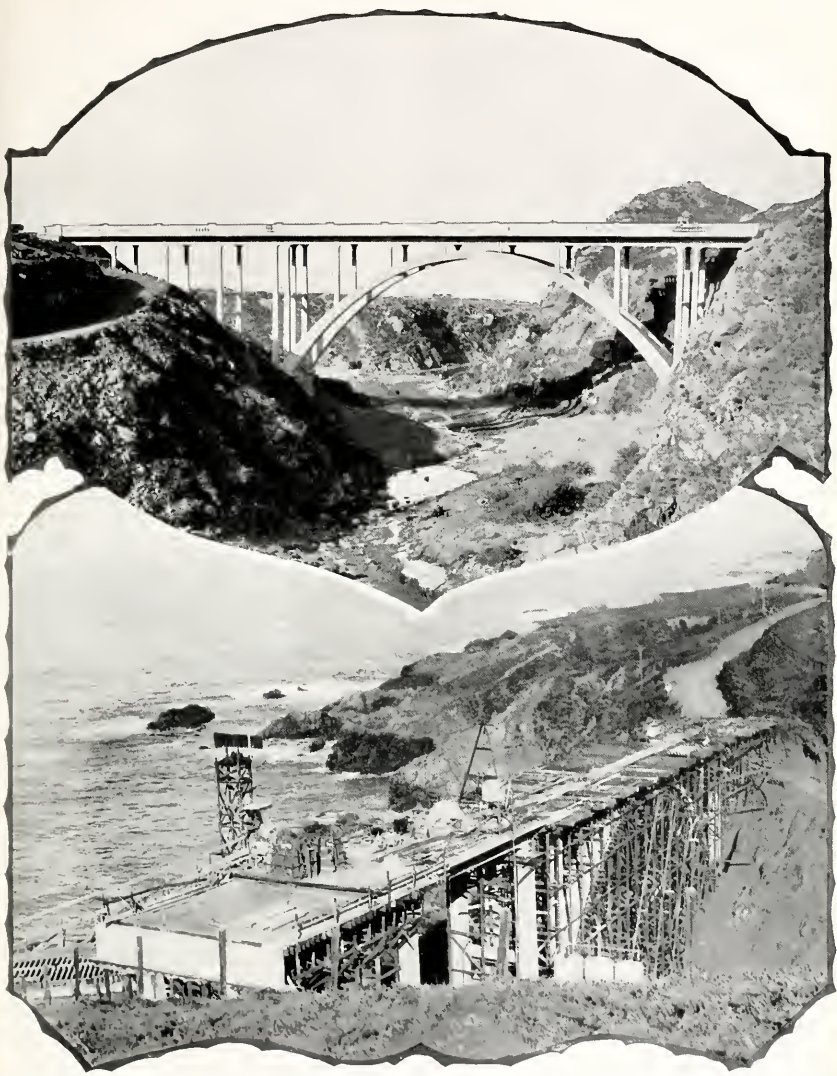
LONGEST SPAN

Five miles south of Garrapata Creek a reinforced concrete arch is being built across Bixby Creek with a main span of 330 feet and nine 40-foot girder approach spans. This will be the longest concrete arch span on the California State Highways.

The contract price is \$203,334. Ward Engineering Co. of San Francisco are the contractors and I. O. Jahlstrom, resident engineer. This bridge is scheduled for completion in June, 1932.

About the first of the year bids will be received for an arch bridge over Rocky Creek, about one-half mile north of Bixby Creek. The Rocky Creek Bridge will cost in the neighborhood of \$100,000.

Plans are also being prepared for an arch bridge over Wildcat Creek five and one-half miles south of Carmel. This is a highly developed resident section and a special study is being made to have the bridge harmonize with its surroundings.



BEAUTIFUL BRIDGES, an imposing series of them, will mark the new State highway now in course of construction along the rugged coast between Carmel and San Simeon. One of the most scenic portions of the Pacific shoreline, this section is indented by arms of the sea and furrowed by deep gorges through which mountain streams reach the ocean making bridges necessary for a direct highway route. Five of them are required in a distance of thirty miles. Two of these are the Garrapata Creek Bridge shown at the top, a 285-foot structure, sixteen miles south of Carmel, completed and opened to traffic this month and the Granite Creek Bridge, eleven miles south of Carmel and 288 feet long, shown in the lower picture, which will be completed in February.

Highway Bids and Awards for October

ALAMEDA COUNTY—Between Greenville and Livermore, about 5.2 miles to be graded and paved with asphalt concrete. Dist. IV, Rt. 5, Sec. 4, Southern California Roads Co., Los Angeles, \$125,105; Valley Paving and Construction Co., Fresno, \$149,993; A. Teichert & Son, Inc., Sacramento, \$140,724; S. H. Palmer, San Francisco, \$167,349; California Construction Co., San Francisco, \$133,248; Heafey-Moore Co., Oakland, \$168,535; Hanrahan Co., San Francisco, \$121,862; Morrison-Knudsen Co., Boise, Idaho, \$178,144. Contract awarded to Jones and King, Hayward, \$116,828.

BUTTE AND GLENN COUNTIES—Reconstructing timber deck of one 313-foot 4-inch swing span and two 134-foot 9-inch approach spans of bridge across Sacramento River near Hamilton City. Dist. III, Rt. 47, Sec. A, Campbell Construction Co., Sacramento, \$9,666; Ralph Hunter, Sacramento, \$11,230; M. R. Peterson, Sacramento, \$11,542; Holdener Construction Co., Sacramento, \$10,265; John Berlinger, Orland, \$11,550; Lindgren & Swinerton, Inc., Sacramento, \$12,130; H. C. Martin, Sacramento, \$12,582; Gutliere Bros., Oakland, \$9,526; M. A. Jenkins, Sacramento, \$10,605; John W. Haltermann, Willows, \$9,327; P. F. Bender, North Sacramento, \$11,934. Contract awarded to R. B. McKenzie, Red Bluff, \$9,150.

GLENN COUNTY—Removing timber deck and rails of the three steel stringer bridges across draws between 20 and 22 miles east of Willows, constructing laminated timber floor, timber rails and adding steel stringers. Dist. III, Rt. 45, Sec. C, Tieslan Bros., Berkeley, \$9,724; J. P. Brennan, Redding, \$9,559; M. R. Peterson, Sacramento, \$9,816; M. A. Jenkins, Sacramento, \$9,270; Peter F. Bender, North Sacramento, \$9,105; Lindgren & Swinerton, Sacramento, \$9,429; H. Gould, Sacramento, \$10,790; John Berlinger, Orland, \$8,461; R. B. McKenzie, Red Bluff, \$9,308; J. W. Haltermann, Willows, \$8,785. Contract awarded to Hugh C. Martin, Sacramento, \$8,117.

LOS ANGELES COUNTY—Between La Canada and Mt. Wilson, about 1.4 miles to be treated with heavy fuel oil. Dist. VII, Rt. 1, Sec. A, J. A. Lazaveze, Los Angeles, \$1,800; Gilmore Oil Co., Ltd., Los Angeles, \$1,968; The Petrol Corporation, Los Angeles, \$2,004; Pacific Tank Lines, Inc., Los Angeles, \$2,220. Contract awarded to Square Oil Co., Inc., Los Angeles, \$1,248.

LOS ANGELES COUNTY—Washington Boulevard to El Segundo, 5.1 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 60, Sec. C, Maceo Construction Co., Clearwater, \$320,624; Kovacevich & Price, Inc., South Gate, \$282,984; Matich Bros., Elshore, \$281,821; Gibbons & Reed Co., Burbank, \$322,171; Oswald Bros., Los Angeles, \$310,183; R. A. Watson, Los Angeles, \$310,845; McCray Co., Los Angeles, \$313,703; Sander Pearson, Santa Monica, \$318,191; Geo. R. Curtis Paving Co., Los Angeles, \$341,474; Griffith Co., Los Angeles, \$291,263; Basich Bros., Torrance, \$286,358. Contract awarded to John Bressi Construction Co., Inc., Los Angeles, \$273,473.

MENDOCINO COUNTY—Through Boonville, 1.10 miles to be graded and surfaced with screened gravel. Dist. IV, Rt. 48, Sec. B, Chas. N. Chittenden, Napa, \$14,161; Albert Helwig, Sebastopol, \$13,951. Contract awarded to Peter McHugh, San Francisco, \$11,569.

MERCED COUNTY—Three timber bridges near Los Banos, one of five 19-foot spans, one of sixteen 19-foot spans and one of twelve 19-foot spans. Dist. VI, Rt. 32, Secs. B and C, Peter McHugh, San Francisco, \$30,763; Fore Construction Co., Piedmont, \$40,109; W. Hoopes, Sacramento, \$34,004; L. C. Clark and C. E. Doughty, Visalia, \$32,154; M. B. McGowan, San Francisco, \$34,344; A. W. Kitchen, San Francisco, \$33,946; R. H. Travers, Los Angeles, \$36,265; Lord and Bishop, Sacramento, \$32,728; E. K. Angle, Dos Palos, \$31,687. Contract awarded to Thermotite Construction, Inc., San Jose, \$30,098.

MONTEREY COUNTY—At Bradley, about 0.5 mile to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. I, W. A. Dontanville, Salinas, \$30,951; J. L. Conner, Monterey, \$34,825; Granite Construction Co., Ltd., Watsonville, \$28,469; Gist & Bell, Arcadia, \$34,878; Fred W. Nighbert, Bakersfield, \$38,594; C. W. Wood, Stockton, \$32,247; Lord and Bishop, Sacramento, \$31,164. Contract awarded to Steele Finley, Santa Ana, \$27,392.

MONTEREY COUNTY—Between Rocky Creek and San Remo Divide, about 8.3 miles to be graded and surfaced with selected material. Dist. V, Rt. 56, Secs. G-H, Maceo Construction Co., Clearwater, \$233,384; C. G. Willis & Sons, Los Angeles, \$240,001; Granfield, Farrar & Carlin, San Francisco, \$200,760; Granite Construction Co., Ltd., Watsonville, \$211,982; C. W. Wood, Stockton, \$228,522; Clark & Henery Construction Co., San Francisco, \$243,337; Hemstreet & Bell, Marysville, \$193,236; Peter McHugh, San Francisco, \$239,871; M. J. Murphy, Inc., Carmel, \$217,662; Chas. Harlowe, Jr., Oakland, \$237,215; S. H. Palmer, San Francisco, \$273,801; Healy-Tibbitts Construction Co., San Francisco, \$176,709; M. J. Bevanda, Stockton, \$153,862; Lang Transportation Co., Los Angeles, \$252,340; Lewis Construction Co., Los Angeles, \$233,339; Porter Bros. Corporation, San Francisco, \$275,112; J. L. Conner, Monterey, \$189,781; Guy F. Atkinson Co., San Francisco, \$232,589; Skeels & Graham Co., Roseville, \$233,579; von der Hellen & Pierson, Castaic, \$213,956; Contolous Construction Co., San Francisco, \$242,317; Ishell Construction Co., Carson, City, Nevada, \$225,679; Geo. Pollock Co., Sacramento, \$219,749; Larsen Bros., Galt, \$197,191; Morrison-Knudsen Co., Boise, Idaho, \$187,402. Contract awarded to D. McDonald, Sacramento, \$169,991.

ORANGE COUNTY—About 0.3 mile of highway embankment to be dredged from the channel known as the North Arm of Newport Bay. Dist. VII, Rt. 60, Sec. B. Contract awarded to Sparkes & McClellan, Newport Beach, \$9,100.

PLACER COUNTY—Between Newcastle and Wise Power House, about 2.7 miles; about 1.6 miles to be graded and about 2.7 miles to be paved with Portland cement concrete. Dist. III, Rt. 7, Sec. A, Watson, Stockton, \$109,783; Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$103,131; N. M. Ball, Berkeley, \$103,333; John Doyle, San Jose, \$148,564; T. M. Morgan Paving Co., Los Angeles, \$127,604; Morrison-Knudsen Co., Boise, Idaho, \$113,774. Contract awarded to Hanrahan Co., San Francisco, \$102,962.

RIVERSIDE COUNTY—Near Bendel's Corner, from Mile Post 83.9 to Mile Post 85.4, 1.5 miles, heavy fuel oil to be applied to shoulders. Dist. VII, Rt. 26, Sec. G, Paulsen & March, Inc., Los Angeles, \$1,274; Square Oil Co., Inc., Los Angeles, \$1,266; Pacific Tank Lines, Inc., Los Angeles, \$1,508; Gilmore Oil Co., Ltd., Los Angeles, \$1,492. Contract awarded to The Petrol Corporation, Los Angeles, \$1,244.

SAN LUIS OBISPO COUNTY—Additions to be made to existing water and sanitary sewer systems in Arroyo Grand. Dist. V, Rt. 2, Sec. F. E. Peel, Los Angeles, \$1,997; Santa Maria Construction Co., Santa Maria, \$2,116; Frederickson & Watson Construction Co., Oakland, \$2,306. Contract awarded to Wm. Lane, Paso Robles, \$1,878.

SAN LUIS OBISPO COUNTY—Los Berros Creek to Arroyo Grande 5.8 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. F, Healy-Tibbitts Construction Co., San Francisco, \$282,862; M. J. Bevanda, Stockton, \$270,825; Gist & Bell, Arcadia, \$314,132; Granite Construction Co., Ltd., Watsonville, \$267,617; Clark & Henery Construction Co., San Francisco, \$291,652; C. W. Wood, Stockton, \$267,810; Southern California Roads Co., Los Angeles, \$268,499; Hanrahan Co., San Francisco, \$283,957; Morrison-Knudsen Co., Boise, Idaho, \$273,912; John Bressi Construction Co., Inc., Los Angeles, \$266,954. Contract awarded to Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$264,016.

SAN MATEO AND SANTA CLARA COUNTIES—Between Redwood City and Oregon Avenue, 6.2 miles to be graded and paved with Portland cement concrete. Dist. IV, Rt. 68, Secs. D and A, C. W. Wood, Stockton, \$482,069; Peninsula Paving Co., San Francisco, \$408,360; Healy-Tibbitts Construction Co., San Francisco, \$521,078; Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$458,678; N. M. Ball, Porterville, \$473,459; Southern California Roads Co., Los Angeles, \$456,600; Hanrahan Co., San Francisco, \$434,971. Contract awarded to Basich Brothers Construction Co., Torrance, \$406,625.

Highway Commission Holds Meeting and Hears Delegations in San Diego

FOLLOWING its announced policy of holding meetings in various parts of the State whenever circumstances permit and responding to requests from official and civic bodies of San Diego County for the consideration of certain road problems and projects in that section, the California Highway Commission held its regular meeting of October 29th in the city of San Diego. It was the first time the Commissioners have been able to convene outside of Sacramento headquarters since Governor James Rolph, Jr., appointed them to office.

The Commission and members of its legal clerical and engineering staffs were met the preceding afternoon at Del Mar by a reception committee from San Diego headed by Mayor Walter Austin and including Senator William Harper, Supervisors Thomas Hurley and Edward Hastings, Assemblymen Edward Head and George Bowers; County Surveyor Ernest Childs, Frank Forward, chairman of the San Diego Chamber of Commerce Harbor Committee; John L. Fox, director and acting chairman of the Chamber's highway committee, and T. C. Macaulay, manager of the Chamber.

ESCORTED TO CITY

The committee conveyed the greetings of the City and County of San Diego, the Chamber of Commerce and the citizens in general to the Commissioners and escorted them to the U. S. Grant Hotel where the Commission made its headquarters during its stay in San Diego.

That evening the Commission and staff members were guests at a banquet in the San Diego hotel given in their honor by the Chamber of Commerce and attended by prominent San Diegans, city and county officials and local representatives of the State Legislature.

John L. Fox presided and seated with him at the speakers' table were: Chairman Earl Lee Kelly of the Highway Commission, Commissioners Harry A. Hopkins of Taft, Philip A. Stanton of Anaheim, and Frank A. Tetley of Riverside; C. H. Purell, State Highway Engineer; C. C. Carleton, Chief of the Divi-

sion of Contracts and Rights of Way, State Department of Public Works; District Engineer S. V. Cortelyou, Division of Highways, Los Angeles; District Engineer, E. Q. Sullivan, Division of Highways, San Bernardino; and Russell Bevans, Registrar, Department of Motor Vehicles.

The principal address of the evening was made by Chairman Kelly of the Highway Commission who also conveyed the regrets of Colonel Walter E. Garrison, director of the Department of Public Works, and Commissioner Timothy A. Reardon of San Francisco at their enforced absence—Mr. Reardon through the sudden illness of his wife and Colonel Garrison because of his attendance at the meeting of Western Governors Conference at Portland, Oregon, where Governor Rolph's illness had prevented the latter's appearance among the scheduled speakers.

BIENNIUM PLANS

In his speech Chairman Kelly explained how during the present biennium approximately \$5,000,000 will be spent on roads in the general vicinity of San Diego in carrying out a comprehensive plan for the development and maintenance of highways in that county.

State Highway Engineer Purell told the assemblage that the Highway Commission is not engaged in a spending orgy but is working on a sound, orderly program of highway development, made possible by gas tax revenues, that will require some years to complete and comprises shortening of routes and changes in the major highway system.

Colonel Ed Fletcher, nestor of highway boosters in San Diego County, called upon to speak from the floor, told of pioneer day efforts to get good road connections between settled sections of the county. He expressed the hope that U. S. Highway 80, starting from the Atlantic coast near Savannah and bringing into San Diego the traffic over U. S. 90 from St. Augustine, Florida, where the Spaniards first landed in America, might be continued by a paved link from San Diego to Point Loma where Cabrillo first landed and planted the Spanish flag on the Pacific coast.

South Bay Chambers Urge Projects

(Continued from preceding page)

The necessity of keeping the gasoline tax money for State highway construction, and the advisability of tree-planting for beautification of highways were among topics discussed by others speakers, including Senator Harper who complimented the Commissioners on their record as "doers."

The regular monthly meeting of the Commission held next day in the Colonial Assembly room of the U. S. Grant Hotel was attended by some seventy-five citizens, officials and delegations from suburban communities.

A delegation from Long Beach headed by R. O. Baldwin, representing the Long Beach Chamber of Commerce presented a request for assistance in financing a link of the State highway through Long Beach.

A Ventura delegation, through D. C. Millan asked cooperation in a project that includes building a by-pass and widening and changing the present highway through that city.

ROUTE TO BORDER

A delegation including representatives of the South Bay Chambers of Commerce from Chula Vista and vicinity was heard on the question of final alignment of the State highway between National City and the border and a proposition for the opening of an old road running easterly by way of Dulzura, Potrero and Campo for a more direct connection with the Imperial Valley highway.

A request that San Diego County be reimbursed for a strip of highway extending 1500 feet north from the international line at San Ysidro being constructed according to State specifications at a cost not to exceed \$25,000, was presented by Chairman E. A. Hornbeek of the county board of supervisors. The Commission agreed to reimburse the county as soon as funds are available.

Supervisor Thomas Hurley explained a proposition for the joint purchase by State and county of the

Coronado Silver Strand for a State park and was informed concerning the procedure for the maintenance of the Strand road as a State highway.

GREETED BY GOVERNOR

After the meeting Chairman Kelly and the Commissioners were entertained by Mr. John Forward at a banquet at Agua Caliente attended by Chamber of Commerce, city, county and State officials, as fellow guests. The occasion was marked by the exchange of felicitations between Mr. Kelly and Governor Lerdo de Tejada, of Baja, California, who dropped in to extend his greetings.

On the following day, Friday, October 30th, the Commissioners inspected the route of the proposed link joining U. S. 80 with the coast at Point Loma and then journeyed some sixty miles east on U. S. 80 to Live Oak Springs to attend formal dedication ceremonies marking the completion of eight miles of paving comprising the last link of the all-paved highway between San Diego and Phoenix.

Hal Hobson, chairman of the National Road Committee of the Chamber of Commerce and manager of the San Diego branch of the Automobile Club of Southern California was chairman, and in attendance were county and Chamber of Commerce officials from San Diego, Imperial, El Centro, Brawley and Calexico.

In the evening Commissioners and staff were entertained by Councilmen J. V. Alexander, J. J. Russo and friends of San Diego.

On their way north next day, the Commission officials were guests of Commissioner and Mrs. Philip Stanton at a barbecue on the Stanton home ranch near Anaheim. More than 150 other guests were present representing a cross-section of distinguished political and social circles of southern California and a tribute to the esteem in which Commissioner and Mrs. Stanton are held by their fellow citizens.

Repairs or Alterations of Dams Approved

(Continued from page 30)

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

MODOC COUNTY—Lauer Dam No. 128-2, Frank McArthur, Alturas, owner; earthfill, situated on unnamed drainage tributary to North Fork Pit River in Sec. 15, T. 44 N., R. 13 E., M. D. B. and M.

NAPA COUNTY—Lake Marie Dam No. 1-6, Napa State Hospital, Imola, owner; situated on Tulocay Creek tributary to Napa River in Sec. 19, T. 5 N., R. 3 W., M. D. B. and M.

SAN MATEO COUNTY—Burlingame Dam No. 611, California Water Service Company, San Francisco, owner; earth dam, situated on unnamed stream tributary to San Francisco Bay.

SAN JOAQUIN COUNTY—Davis Dam No. 572, Ferroggiaro and Podesta, Linden, owners; earth, situated on Shaw Creek tributary to Calaveras River in Sec. 6, T. 2 N., R. 9 E., M. D. B. and M.

SHASTA COUNTY—False Lake Dam No. 223, O. Merlo, Redding, owner; earth, situated on North Fork

Jenny Creek tributary to Sacramento River in Sec. 4, T. 31 N., R. 5 W., M. D. B. and M.

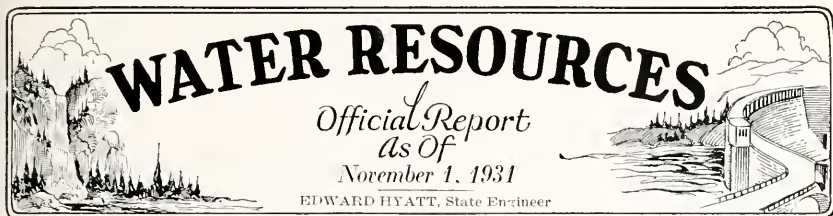
CONTRA COSTA COUNTY—Black Hills Dam No. 183-2, Mt. Diablo Country Club, Diablo, owner; earth situated on unnamed creek tributary to Green Valley Creek in Sec. 14, T. 1 S., R. 1 W., M. D. B. and M.

SONOMA COUNTY—Lake Ralphine Dam No. 422, Santa Rosa Water Works, Santa Rosa, owner; earth dam.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86, Pacific Gas and Electric Company, San Francisco, owner; earth, 6 feet above streambed with a storage capacity of 400 acre-feet, situated on North Cow Creek tributary to Sacramento, located in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M. For storage purposes, for power use.

MODOC COUNTY—Big Sage Dam No. 55—Hot Spring Valley Irrigation District, Alturas, owner; earth, situated on Rattlesnake Creek tributary to Pit River in Sec. 1, T. 41 N., R. 13 E., M. D. B. and M.

PLUMAS COUNTY—Grass Lake Dam No. 284, Carnation Gold Mining Company, Blairsden, owner; earth dam, situated on Little Jamison Creek tributary to Jamison, located in Sec. 36, T. 22 N., R. 11 E., M. D. B. and M.



The Division of Water Resources under State Engineer Edward Hyatt has issued the first complete history of California water reclamation districts in a bulletin giving data beginning with the old swamp land fund districts and recording the financial status of present active districts. In the following report are included other important details of flood control, reclamation, dam applications and maintenance work and the news that tests show salinity in the upper Sacramento delta has greatly receded:

The Department of Public Works has released Bulletin No. 37, "Financial and General Data Pertaining to Irrigation, Reclamation and Other Public Districts in California." This bulletin was prepared under the direction of the California Irrigation and Reclamation Financing and Refinancing Commission, created by the Legislature in 1929.

In December, 1930, the commission reported to the Governor on the financial status of irrigation, reclamation and other agricultural districts, with conclusions and recommendations for legislation. Much of the legislation affecting such districts enacted by the 1930-31 Legislature and approved by the Governor, was based on the recommendations of the commission. Bulletin 37 is supplemental to the report to the Governor and records in full the data supporting the conclusions of the commission.

This is the first publication to bring together in complete form data concerning the history, organization and operation of California reclamation districts. The bulletin gives a brief history of all of the reclamation districts, beginning with the old swamp land fund districts, and records the present financial status of the 182 active California reclamation districts, with a brief discussion of the causes leading to the default of some of these districts.

REFUNDING PLANS

Two meetings of the Districts Securities Commission were held during the month, both of which were devoted principally to the consideration of a plan proposed by the Merced Irrigation District for refunding its bond issues amounting to a total of \$16,250,000.

The following districts approved refunding bond issues in special elections.

Nevada Irrigation District, Nevada County.....	\$8,100,000
South San Joaquin Irrigation District, San Joaquin County.....	4,791,250
Oakdale Irrigation District, Stanislaus County.....	2,320,000
Grenada Irrigation District, Siskiyou County.....	136,000

The proposal to issue \$93,000 in bonds by the Linden Irrigation District, San Joaquin County, was defeated at a special election, September 26.

DAMS

To date 777 applications have been received for approval of dams built prior to August 14, 1929; 86 applications for approval of plans for construction or enlargement; and 196 applications for repairs.

a. Applications for Approval of Plans for Construction of Dams.

Dam	Owner	County
Bouquet Canyon	City of Los Angeles	Los Angeles
Loosely Pool	T. H. Vestal et al	Lassen
San Gabriel No. 2	L. A. Co. Flood Control Dist.	Los Angeles

Bouquet Canyon Dam is to be a 200' earthfill, storing 36,200 acre-feet for use of the City of Los Angeles water supply.

San Gabriel No. 2 will be a rockfill dam 260 feet high. This is one of several lesser structures to be built in lieu of the proposed San Gabriel No. 1 dam, the site for which was disapproved by the State Engineer as one of his first official actions under the new law governing the supervision of dams, which went into effect in 1929.

b. Applications for Approval of Plans for Repairs or Alterations.

Fifteen such applications have been received during this period, indicating the willingness of owners to place their dams in first-class condition prior to the 1932 run-off season.

c. Nine applications for approval of plans for construction of dams have been approved during the period.

d. Sixteen applications for approval of plans for repairs or alterations of dams have been approved this month.

FLOOD CONTROL AND RECLAMATION

a. Maintenance of Sacramento Flood Control Project.

Routine maintenance work has been continued, including the conditioning of the drainage pumping plants.

Two crews of twenty men each have been started on maintenance clearing operations in the Sutter and Tisdale By-passes. In order to relieve unemployment, these crews are operating on a five day week basis and each man is permitted a total of ten days actual work. These men are registered at the courthouse in Yuba City under the direction of the Board of Supervisors and the men most in need of work are taken on.

Our regular maintenance crew is engaged in repairing the timber breakwater at the junction of the

(Continued on next page)

Water Sought for Hydraulic Mining

(Continued from preceding page)

Sutter and Tisdale By-passes. This consists of renewing certain brace piles and braces at a total cost of about \$900.

The work of clearing and stumping approximately twelve acres in the Sacramento By-pass has been completed.

b. Sacramento Flood Control Maintenance—Bank Protection.

Protective work at the ends of the dam across Heffner Slough on the Feather River at Hamilton Bend has been repaired and additional brush placed to prevent wash. The protective work constructed for Levee District No. 2 of Glenn County two years ago has been put in condition by tightening the cables and lashings holding the logs and brush in place.

c. Sacramento Flood Control Project.

The Reclamation Board has requested this Department to undertake clearing work in the lower part of Sutter By-pass at a cost of \$8,000, under Sec. 21 of Reclamation Board Act. This land will be permanently cleared by placing it in condition for cultivation.

d. Emergency Flood Control and Rectification of Rivers.

Bank protection work on the Mad River on the ranch of John Kane has been completed at a cost of approximately \$1,400.

Arrangements are now being made for the continuation of river rectification work on the San Jacinto River at a cost of about \$6,000, two-thirds of which will be contributed by local interests.

e. Mokelumne River.

Arrangements are being completed with San Joaquin County for a continuation of the work of clearing in the Mokelumne River channel, under Chapter 447, Statutes of 1929. Approximately \$4,500 will be expended for labor on this work.

f. Pajaro River.

Additional work in clearing the channel of the Pajaro River will be undertaken under Chapter 524, Statutes of 1929. The Counties of Santa Cruz and Monterey will each contribute \$1,000, the City of Watsonville \$500, and the State \$2,500, making a total of \$5,000 available for the work, which will commence on October 26.

g. Russian River Jetty.

The construction of the track trestle on the jetty at the mouth of the Russian River has been completed and the quarry and railroad have been in operation dumping stone into the jetty. A derrick having a capacity of twelve tons is now being erected for handling the larger stones to be placed on the south face of the jetty.

h. Flood Measurements and Gages.

The automatic water stage recorders maintained by this office during the winter season are now being placed in order and equipment is being assembled for making flood measurements. It is intended to organize and equip ten parties for this work, ready to go in the field on short notice.

WATER RIGHTS

a. Applications to Appropriate.

During the month of September, 19 applications to appropriate water were received, 21 were rejected and 18 were approved by the issuance of permits. During the same period 10 permits were revoked and 7 licenses were issued finally confirming the rights initiated by the pending permits.

The resumption of interest in hydraulic mining is indicated by 3 major applications filed for the appropriation of water for hydraulic mining. One of these is an application by Buckeye Placer Mines, Inc., to appropriate 15 cubic-feet per second and 500 acre-feet per annum from Little Boulder Creek, tributary to Coffee Creek and Trinity River, at an estimated cost of \$12,500. Another is an application by Arlington Mining Corporation, 740 South Broadway, Los Angeles, to appropriate 0.5 cubic-foot per second from Armestre Creek, tributary to Mojave Desert, at an estimated cost of \$25,000. Another is an application by Butte Mining Company, 68 Post Street, San Francisco, to appropriate 30 cubic-feet per second from West Branch of El Dorado Creek, tributary to North Fork of Middle Fork of American River, at an estimated cost of \$30,000.

ADJUDICATIONS

North Cow Creek (Shasta County). The North Cow Creek case came up for hearing in the Superior Court of Shasta County on October 13, 1931, and was postponed to October 26, 1931, to allow counsel time in which to file substitutions covering changes in ownership of certain lands involved in the case.

Clover Creek (Shasta County). The Clover Creek case has been set for hearing January 18, 1932, in the Superior Court of Shasta County.

Los Alamos Creek (Santa Barbara County). The decree of the Superior Court of Santa Barbara County adjudicating the water rights on Los Alamos Creek has been entered.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). All of the water users have signed the stipulation for consent judgment, and the Report of Referee is now in the course of preparation.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek in accordance with the trial schedule of allotments, adopted for the 1931 season, was terminated on October 1.

Franklin Creek (Modoc County). Administration of the trial schedule of allotments, covering the distribution of the waters of Franklin Creek for the 1931 season, was discontinued on October 1.

New Pine Creek (Modoc County). The field investigation of the water supply and use of water on New Pine Creek was completed on October 1.

Eagle Creek (Modoc County). Field work on the Eagle Creek Investigation was completed October 1.

U. S. Cooperating in Snow Surveys

(Continued from preceding page)

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The irrigation draft on the Sacramento River has continued to decrease until at present there is only a very small amount of late irrigation going on. The flow of the Sacramento River at Sacramento has correspondingly increased and on October 14 this flow amounted to 3600 second-feet. There has been but slight increase in the stream flow at the foothill stations on the rim of the valley.

The salinity in the Upper Sacramento Delta has greatly receded and the tests are showing a drop to three or four parts of chlorine per 100,000 as far down as the vicinity of Ryde. There has been some decrease in the lower Sacramento and San Joaquin Deltas but not in the Upper San Joaquin Delta. At some points in the latter location there has been a continued increase until very recently, indicating a "pocketed" condition of the salt. This results from the condition of very little increased flow to the Delta from the San Joaquin River. Sampling at Freepont, Hood Ferry, Walnut Grove, and Ryde stations in the Sacramento Delta was discontinued during the past month. The regular salinity bulletins to the Delta water users will probably be discontinued at the end of October.

The special field investigation to determine the extent of damage both in the up-river territory and throughout the Delta, due to the 1931 water shortage and salinity, has continued. It is necessary to obtain production and yield figures to complete the data of this investigation and many of these figures will not be available until November or later.

Except for the special damage survey it is planned that all field work will be completed the first of November.

The accompanying tabulations of river discharge and salinity show a comparison between the measurements in September and October of this season and the records in October, 1924.

RIVER DISCHARGE

Station	Sept.	Discharge in Second-feet		Oct.
		1931	1924	
Sacramento River at Butte City.....	9/9 1790	10/14 2700	10/14 3200	
Sacramento River at Colusa.....	9/9 1620	10/13 2580	10/14 3350	
Sacramento River at Knights Landing.....	9/8 1440	10/12 2650	10/14 3540	
Sacramento River at Verona.....	9/10 2260	10/14 3420	-----	
Sacramento River at Sacramento.....	9/10 2270	10/14 3600	10/14 4940	
Feather River at Nicolaus.....	9/9 333	10/14 546	10/14 1160	
American River at H Street Bridge.....	9/10 103	10/15 168	10/14 140	
San Joaquin River near Vernalis.....	9/11 271	10/9 465	10/14 542	
Combined Flow of Sacto River at Sacramento and San Joaquin River near Vernalis.....	9/10 2340	10/14 4000	10/14 5480	

SALINITY—SACRAMENTO-SAN JOAQUIN DELTA

Station	9/10/31 10/10/31 10/10/24		
	Parts of chlorine per 100,000		
O. and A. Ferry.....	1360	1120	1030
Collinsville.....	1180	880	915
Three Mile Slough Bridge.....	840	457	378
Rio Vista Bridge.....	640	365	124
Isleton.....	440	114	4
Antioch.....	1100	875	735
Webb Pump.....	620	405	223
Central Landing.....	250	151	75
Middle River R. O.....	250	268	178
Clifton Court Ferry.....	100	125	79
Williams Bridge.....	80	24	7

CALIFORNIA COOPERATIVE SNOW SURVEYS

The principal activity on this work during the past month has been in the field in contacting the various cooperating agencies and getting all in readiness for the coming season's surveys.

In the Tuolumne and Merced River Basins in Yosemite National Park, arrangements were completed for cooperation between the Park Service, the Merced Irrigation District and the State. New snow survey courses were established, signed, and sketched, at Merced Lake, Moraine Meadow and Johnson Lake in the Merced Basin and at Wolverine Meadow on the Tiltail Trail in the Tuolumne Basin. To accomplish the survey of these new courses, new shelter cabins are under construction at Buck Camp and Camp 11. Arrangements were made for additional survey equipment and for stocking the cabins, etc.

Arrangements were recently completed for a new cooperation with the Forest Service in Sequoia National Forest. Under these arrangements the Forest Service will survey a new route including the Copper Creek Summit, Junction Meadow and Bullfrog Lake courses. To accomplish this, a new cabin is under construction at Glenn Flat on the Bubbs Creek Trail and repairs are being made to the stations at Cedar Grove and Kanawers. On the South Kings route surveyed through cooperation with the Sequoia National Park Service, new shelter cabins have recently been completed on Clover Creek and at Scaffold and Rowell Meadows.

Trips were made to the Mono and Owens basins to complete cooperative arrangements with the South Sierras Power Company and to Markleeville to complete the Mokelumne-Carson survey details.

FEDERAL COOPERATION

In connection with the Federal-State cooperation for irrigation investigations, an inspection was made during the past month of the work being conducted in the Sacramento-San Joaquin Delta. This includes an investigation of the consumptive use of water by Delta crops and by noneconomic vegetation such as tules and aquatic growths, as follows:

Asparagus Tanks on Richmond-Chase Tract.
Tule and Cattail Tanks at King Island.
Tule Tanks at Simmons Island.

Official Bodies Concur in Procedure

(Continued from preceding page)

Tule and Cattail Tanks in Reclamation District 999 near Clarksburg.

WATER RESOURCES

a. South Coastal Basin.

Work in the field continued in a routine way except that methods for analysis of water were changed and it is believed that the change will result in reducing the cost of this work to a considerable extent. Preparations are under way for publication of the first report shortly after January 1, 1932.

b. Santa Ana Flood Control Works.

The first structure on Santa Ana Basin flood control works was approved by the State Engineer during the month. This consists of a rock weir across Cucamonga Creek to divert water to spreading works on Cucamonga Cone. Cucamonga Creek is a tributary of Santa Ana River. The financing of the work is done jointly by the State, the County of San Bernardino and the local interests. The work is to follow the general plans laid out in Bulletin 31, Division of Water Resources, and must be approved by the State Engineer. Plans are under way locally for works of various kinds on the numerous creeks tributary to Santa Ana River and also on the main river.

c. Mohave River.

No field work was done during the year by State forces. Arrangements have been made with the Division of Agricultural Engineering and the Geological Survey, both Federal bureaus, to do the work necessary in the field. This is financed half and half by the government and by the State.

d. Ventura Investigation.

The principal work done during the month was drilling at Spring Creek and Blue Point dam sites, both on Piru Creek. Drilling was stopped at Devil Canyon site which was an alternate to Blue Point, as the showing was quite poor at this site. The remainder of the field work consisted of routine measurements and repair of some of the stream gaging stations.

Arrangements were made with the U. S. Division of Agricultural Engineering to make a determination of rainfall penetration on the valley floor in Ventura County. The experience gathered in other investigations of a like nature will be useful in reducing the cost of this work.

e. Salinas Valley Investigation.

The County of San Luis Obispo and the County of Monterey having deposited money with the State Treasurer which releases State money for the same purpose, under the budget bill, work was begun on a preliminary investigation of the water resources of the Salinas Valley. This investigation will continue for two years and at the end of that time it is hoped sufficient data will have been gathered to determine whether it is desirable to go ahead with a comprehensive program for the valley.

f. Santa Clara Valley Investigation.

At the request of the Santa Clara Valley Water Conservation District, with which the Division is

cooperating in the investigation of water resources matters in Santa Clara Valley, the depth to water was taken in 67 wells during the past month from which it is observed that there has taken place since March 1, 1931, a recession of 19.3' in the general ground water level of the valley.

STATE WATER PLAN

Pursuant to the desire of Governor James Rolph, Jr., the organization of the California Water Resources Commission and the several Honorary Advisory Committees named to deal with the water problems of California, has been attended with energetic activity. Widespread response has been manifested by all the membership of the foregoing groups of public-spirited citizens.

On September 28, a meeting of the California Water Resources Commission was held in the State Building, San Francisco, at which time a report was submitted by a subcommittee presenting a plan of procedure and organization which the Commission therewith adopted. In furtherance with the adopted plan of procedure and organization the California Water Resources Commission recessed to meet jointly with the California Joint Legislative Water Committee and the two bodies were addressed by Governor James Rolph, Jr., who directed emphatic attention to the effectiveness of full cooperation by both official bodies to accomplish prompt action in meeting the water problems of California. Upon the suggestion of Governor Rolph, a resolution was adopted by the combined bodies which commended the passage of the bond issue proposed by the Metropolitan Water District to construct the Colorado River Aqueduct.

BODIES COLLABORATE

Subcommittees were appointed by Chairman Crittenden of the Committee and Chairman Judge Sullivan of the Commission to confer on and arrange a plan of cooperative procedure. The two subcommittees concurred in recommendations that the two bodies collaborate at all times in the fullest practicable manner in accordance with the spirit of the resolutions under which each was created.

On September 29 a general meeting composed of the California Water Resources Commission, the California Joint Legislative Water Committee and the Honorary Advisory Committees appointed by Governor Rolph to cooperate with the California Water Resources Commission, was held at Hotel Oakland.

The Honorary Advisory Committee of Engineers has been requested to review and pass upon the State Water Plan as recommended by the Department of Public Works and to consider any modification thereof and to review any other water conservation plans that might be submitted to them.

The California Water Resources Commission met on October 9 to consider the economic phases of Kennett Reservoir, together with the value of electric energy that could be generated under hydroelectric development and the total probable revenues to be derived therefrom.

Sick Child Inspired Move for Lighting Highway Xmas Trees

THE highways of California will be brightened and at many places during the coming Yuletide season by myriads of outdoor lighted Christmas trees.

The Outdoor Christmas Tree Association of California was organized in 1926 by Clarence F. Pratt of San Francisco and was inspired by a little sick child who sent word to Mr. Pratt how much he enjoyed a tree the latter had lighted up on his front lawn.

The idea spread rapidly and was adopted by other cities as a community project; in some instances whole streets being thus illuminated with rows of lighted trees.

THRONGS OF MOTORISTS

For many years Altadena's mile of lighted Christmas trees has attracted thousands of motorists. Each night during the Christmas week the traffic officers have had to call out boy scouts to assist in handling the crowds. One-way traffic did not entirely clear up the situation.

When Golden Gate Park in San Francisco lighted a mile of its trees it required 25 minutes to drive the mile, although traffic officers tried to keep all cars moving. In Fresno, the Fig Garden Club promoted and lighted a mile of trees on Van Ness Avenue. The mile of lighted trees on The Alameda between San Jose and Santa Clara brings out thousands of motorists.

BRIGHTENS HIGHWAYS

Piedmont, In Alameda County, has lighted a group of trees. The Rotary Club of Gilroy has planned a half mile of Christmas trees on the Hecker Pass highway.

Many other communities and civic organizations are taking a whole-hearted interest in the Outdoor Christmas Tree spirit, which will noticeably dispell the clouds of our so-called winter depression. The northern part of the State as well as the southern part is showing an exceptionally early interest in this very worth-while movement, according to Mr. Pratt, who predicts that in a reasonably short time every California city will have its "mile of Christmas trees" on the highway leading into its city limits.

Teacher: Charlie, what does your father do when he finds anything wrong with his car?
Charlie (truthfully): He bawls Ma out.—*Auburn Journal-Republican*.



PIONEER TREE of the Outdoor Christmas Tree Association is this the fifty-foot cypress on the lawn of Clarence F. Pratt's home in San Francisco. When "Sandy" Pratt lighted it in 1926 a sick child sent word of the joy it gave him and started a movement that has caused the illumination of highway trees all over the state.

ENGINEERS READY

In times like these when general business conditions are lagging, and unemployment is a vexing problem, the engineer stands ready to lead the way out. Not with political nostrums but by planning and carrying out works that will provide the needed employment and leave the community richer and better prepared for the prosperous days to come.

Times are bound to improve. Already there are unmistakable signs of improvement in parts of our country. Not one dollar in doles should be given while there are public improvements of lasting value that can be done. There is scarcely a community in the country where such work can not be found.—*North Dakota Highway Bulletin*.

Twenty-six states now have highway patrols, composed of men whose primary duty is to enforce motor vehicle laws and promote safety on the highways.

Great Crowds Greet Governor on Tour to All County Seats

(Continued from page 4)

"I have come to thank you for your support in the recent election. I have come in good faith—not to seek votes, but to learn your problems first hand. I feel that many sections of the State can not properly present their community matters to a government constantly anchored in Sacramento.

"And so I have brought the government to you; I have come to counsel with you; I am accompanied by several members of my official family, here to discuss with you whatever issues affect their particular departments."

Upon his return to Sacramento Thursday, November 19, the Governor made the following comment to the press on his swing around the State:

"I have seen every mountain, stream, and valley in the State. I have met and talked with thousands of my fellow citizens. I feel that these visits to the county seats of California have done much to enable me better to administer the affairs of the State."

State Employees Nominate Officers

At a recent meeting of Sacramento Chapter of the State Employees Association nominations of officers for the ensuing year and arrangements for the chapter's annual dance were the principal matters discussed. The ticket nominated for election by letter ballot was as follows:

For President

Spencer Burroughs, Division of Water Resources

For Vice President

E. R. Higgins, Department of Public Works

For Second Vice President

Roy Womack, Department of Agriculture

Dan Sullivan, Division of Printing

P. R. Green, District 3, Division of Highways

For Secretary

E. W. Zumwalt, District 10, Division of Highways

For Treasurer

H. B. Weaver, Division of Highways

The date set for the annual dance is Saturday night, January 30, and an arrangements committee was appointed with E. Foster as chairman. Any profits resulting from the dance, it was decided, shall go into a special fund to provide other entertainment programs for Sacramento Chapter.

Rush Hour Traffic Cut 10 Per Cent by "McClintock Shift"

THE RUSH HOUR traffic relief plan recently installed in San Francisco has been made the subject of a bulletin issued by the Alfred Russel Erskine Bureau for Street Traffic Research in Harvard University. This bulletin has been published throughout the country. An excerpt follows:

San Francisco has recently accomplished one of the most fundamental and promising improvements in street traffic ever attempted in any city, according to transportation authorities. For the first time a city has succeeded in materially reducing the severity of the morning and afternoon rush hour demands on traffic and transportation facilities.

These movements, commonly known as peak loads, have long been considered as one of the inevitable evils of city life, resulting in inconvenience to thousands of travelers and in great waste in the maintenance of otherwise surplus equipment.

By the application of the so-called "McClintock shift," the similarity in the hours of retail and other types of business has been broken down and the rush hour flow of traffic has been reduced by more than ten per cent. One hundred and fifty business firms participated in the adjustment.

Ramps, She Wants, For Regaining Hats

State of California.

Division of Highways,
Sacramento, Calif.

Gentlemen:

Please will you run a few ramps off your Yolo causeway? I lost my new fall hat there as irrevocably as in midocean. We looked over—too far to jump—we went on, thinking it might be possible to drive back through the pasture land, but that was not possible, so another hat I had to buy in Redding. I only hope it fell to the lot of a goat—the greenness of it would certainly make its appeal. Ramps for the sake of future travelers!

Sincerely,

GLADYS TROUTMAN,
Monroe, Washington.

Hubby: You're going for a drive with me, aren't you?

Wife: I'm not the person to back out.

Hubby: No, it would be better for the garage if I did.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

EARL LEE KELLY, Chairman, Redding
HARRY A. HOPKINS, Taft
TIMOTHY A. REARDON, San Francisco
PHILIP A. STANTON, Anaheim
FRANK A. TETLEY, Riverside
C. H. PURCELL, State Highway Engineer, Sacramento
JOHN W. HOWE, Secretary
HUGH K. McKEVITT, Attorney, San Francisco

HEADQUARTERS STAFF, SACRAMENTO

G. T. McCOY, Principal Assistant Engineer
L. V. CAMPBELL, Office Engineer
T. E. STANTON, Materials and Research Engineer
FRED J. GRUMM, Engineer of Surveys and Plans
C. S. POPE, Construction Engineer
T. H. DENNIS, Maintenance Engineer
F. W. PANHORST, Acting Bridge Engineer
R. H. STALNAKER, Equipment Engineer
E. R. HIGGINS, Comptroller

DISTRICT ENGINEERS

F. W. HASELWOOD, District I, Eureka
H. S. COMLY, District II, Redding
CHARLES H. WHITMORE, District III, Sacramento
J. H. SKEGGS, District IV, San Francisco
L. H. GIBSON, District V, San Luis Obispo
E. E. WALLACE, District VI, Fresno
S. V. CORTELYOU, District VII, Los Angeles
E. Q. SULLIVAN, District VIII, San Bernardino
F. G. SOMNER, District IX, Elshoph
R. E. PIERCE, District X, Sacramento
General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division
J. J. HALEY, Jr., Administrative Assistant
HAROLD KONKLING, Deputy in Charge Water Rights
A. D. EDMONSTON, Deputy in Charge Water
Resources Investigation

R. L. JONES, Deputy in Charge Flood Control and
Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams
SPENCER BURROUGHS, Attorney
EVERETT N. BRYAN, Hydraulic Engineer, Water
Rights

A. N. BURCH, Irrigation Investigations
H. M. STAFFORD, Sacramento-San Joaquin Water
Supervisor
GORDON ZANDER, Adjudication, Water Distribution
KATHERINE A. FEENY, Chief Clerk
MABEL PERRYMAN, Secretary

DIVISION OF ARCHITECTURE

GEO. B. McDougall, Chief, Division of Architecture
P. T. POAGE, Assistant Architect
W. K. DANIELS, Deputy Chief of Division

HEADQUARTERS

H. W. DeHAVEN, Chief Architectural Draftsman
C. H. KROMER, Structural Engineer
CARLETON PIERSON, Specification Writer
C. O. PALM, Chief Clerk
C. E. BERG, Engineer, Estimates and Costs
J. W. DUTTON, General Superintendent Construction
W. H. ROCKINGHAM, Mechanical Engineer
C. A. HENDERLONG, Assistant Mechanical Engineer
W. M. CALLAHAN, Electrical Engineer

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief
FRANK B. DURKEE, General Right of Way Agent
C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor
Port of San Jose—Not appointed
Port of San Diego—Edwin P. Sample

Scale of Miles

UNITS FOR INITIAL DEVELOPMENT
UNITS FOR ULTIMATE DEVELOPMENT



CALIFORNIA HIGHWAYS and PUBLIC WORKS

1 9 3 2



Official Journal
of the
DEPARTMENT
of
PUBLIC WORKS
STATE OF
CALIFORNIA

December 1931

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803 Miles of Road Built 115 Public Buildings Erected in 1931

Department of Public Works Shows a Record Breaking Year
for Highway and Architectural Divisions

By COLONEL WALTER E. GARRISON, Director of Public Works

EXCEEDING by several millions of dollars the improvement record of any former year, the Public Works Department of the State of California will pass from 1931 into 1932 in full action against another impressive schedule of work.

Dollar marks and figures are the only symbols by which the story can be reduced to concrete form. But, back of the cold figures is the exhibit of work well done; and the diffusion of comfort and happiness to tens of thousands of families through the circulation of these dollars.

TOLD IN FIGURES

The work of the Highway Division is so continually under the eyes of millions that a summing up of its annual story must prove of special interest to Californians. This is written in mid-December. The totals about to be given (with the exception of an item of \$1,593,200 covering bids to be opened prior to January 1) are those on completed or going projects. That item is now read into the total as it will have been contracted by the time this reaches the reader.

The Division of Highways has transacted a business during 1931 that totals \$42,554,000. The items entering into the total are: Work under way \$24,648,200; bids to be opened prior to January, \$1,593,200; work carried

over from 1930, \$9,402,600; maintenance cost for the year, \$6,910,000.

Converted into terms of mileage, the record shows 803 miles of completed or progressing improvement. The items making this total follow: Graded, 70 miles; untreated crushed rock surface, 59 miles; bituminous treated crushed rock surface, 454 miles; bituminous macadam pavement, 7 miles; Portland cement concrete pavement, 138 miles; asphalt concrete pavement, 75 miles.

The California State Highway system comprises 7281 miles. Of this total, 3091 miles are paved; 1425 graded and merely surfaced with oil and crushed stone; 819 graded and macadamized—leaving 1946 miles ungraded and un-surfaced, practically untouched.

Responding to public demand, the Legislature each session makes an orderly inclusion of secondary road mileage. The last Legislature alone added roads that call for an expenditure of \$71,000,000. This vast amount covers only one biennium's increased demand on funds available for construction, recon-

struction and maintenance. The fine showing for 1931 is, after all, only a credit against a vast and increasing debit.

It follows that if the program is to go forward, the present sources of revenue, majoring in the gas tax, must remain unimpaired.



Colonel Walter E. Garrison

Fighting Snow on Mountain Highways With Latest Methods and Machinery

By T. H. DENNIS, Maintenance Engineer

For the first time in the history of California a determined effort is being made to keep Donner Pass on the Victory Highway through the Sierra Nevada range, open to traffic throughout the Winter. This famous gateway to Northern California traverses a heavy snowfall area ninety miles long and reaches a maximum elevation of 7135 feet at Donner Summit. The following article describes the methods and modern heavy equipment now in use battling snow on this and other mountain highways.

FOR NEARLY ten years the Division of Highways organization has been interested in the problem of snow removal. It was evident in 1922 that the increase in motor travel, coupled with the improvement of the mountain roads, would eventually justify keeping the main through routes open to traffic.

The first special equipment for this work was assigned the Pacific Highway between Dunsmuir and Weed in cooperation with Siskiyou County. Provision was also made for taking care of the occasional heavy storms which might block the Ridge Route between Los Angeles and Bakersfield. These two routes have comparatively light snowfall, although removal work is required each winter on the Pacific Highway where an elevation of about 3800 feet is reached.

Nothing special was done on the other routes for several years, except as roads could be opened with the regular tractor and grader equipment, as, for instance, the roads between Redding and Alturas, Redding and Arcata, and Nevada City to Downieville. The principal reason for this was not lack of appreciation of the benefits to traffic, but was due to the unimproved conditions of the mountain roads.

Narrow Road Handicaps

It is not possible to handle any great quantity of snow within the limits of a narrow, crooked road. Even if the road is free from

snow it is very difficult to keep it passable under California winter traffic conditions unless the road surface is rocked or paved. The next step in the snow removal work, therefore, was a concerted effort to keep certain snow routes open as late as possible in the fall, and to open them as soon as conditions permitted each spring.

This stage still holds for a number of the State routes and will continue to apply for some years to come.

This period gave the organization opportunity to try out various methods of work and types of equipment, as well as gain experience which is so essential to the success of snow removal operations.

Two years ago, equipment was allotted to the lateral between Red Bluff and Susanville so that the route was kept open throughout the winter. The road crosses two summits—one at Mineral and the other at Fredonia Summit, which is at an elevation of about 5000 feet. Last year, additional equipment, including two rotary shovel type

plows, truck mounted, was secured for the Donner Pass route between Sacramento and Reno. This road was opened several times during the winter season, it being closed only one month during the year to traffic. While gratifying to the traveling public, this success was possible only because of the unusually light snowfall and especially favorable winter conditions.

The completion of construction work during the

(Continued on page 16)



T. H. DENNIS



KING WINTER WORKS overtime on this Donner Summit area of his frigid domain. Here is a view of the Eastern Donner Grade taken from a point just below the Summit showing the snow-covered road that maintenance crews are keeping open to traffic and Donner Lake in the distance.



This fixed shovel rotary type machine keeps the road open on the Crest Route near Big Bear Lake, San Bernardino County.



Speed push plow from the Colfax station operating near Soda Springs on the Auburn-Truckee road.



SNOW FIGHTERS DIG IN to these comfortable quarters on the Donner Summit whenever they can call it a day. The house accommodates sixteen men and the roundhouse shed and machine shop houses ten big truck plows. Both buildings are steamheated.

Cajon Pass Curves Doomed, 59 of Them-- Improvement Involves Moving a Creek

By E. Q. SULLIVAN, District Engineer

CAJON PASS, historic gateway to southern California for all transcontinental traffic entering the State through Needles and Las Vegas, is again to be touched by the magic wand of modern engineering and have some of its narrow, winding stretches replaced by the highest type of State highway alignment and construction.

In addition to accommodating all transcontinental traffic entering over the National Old Trails and Arrowhead Trail, this famous old pass is the only outlet to those routes for east-bound traffic from Los Angeles and the San Bernardino Valley as well as a thoroughfare for airways and railways into and out of southern California.

Most Scenic Canyon

Sixteen miles in length with a rise of about 3000 feet, the pass crosses the spectacular San Andreas Fault with its high up-turned cliffs and seemingly loses itself among towering mountains where the upper reaches of the Mojave River flow down to the desert. Cajon or Box Canyon it was therefore called by the early Californians who knew it as an Indian trail, later used by Forty-niners and Mormon settlers.

It is a most scenic canyon with changing views of ever new beauty at every turn and rise, according to the season of the year—snow-capped mountains, violet-colored, misty hills, beautiful spring flowers or red holly berries, groups of sycamore and wild walnut trees, thousands of yucca plants and over all the hill-sides a thick, luxuriant growth of chaparral.

The present road was built in 1916 and was a marvelous improvement on the old ox-cart trail which meandered up the pass and then turning off to one side into Horse Thief Canyon continued its tortuous way across a creek and over a narrow grade up the gorge to the summit. Horse Thief Canyon was abandoned for the present route directly up the pass, which was taken over by the State ten years ago.

Record Height Cuts

In 1930, the upper three and one-half miles were relocated, eliminating a number of

rather steep switchbacks dangerous in wet weather. By means of great cuts, some of them of record-breaking heights in State highway construction, a direct, wide, high-gear grade was provided to the summit.

Now important improvements of the lower portion are to be made and have been let to contract, beginning near Alray, where two undergrade crossings are being constructed to make a safe crossing for the Santa Fe Railroad, which has used the pass for 46 years.

The line for the relocated highway sweeps up the pass in long, easy curves, reducing the number of present sharp turns and curves from 91 to 32. The new curves will be of such great radius as to make them safe and secure for motorists under all conditions of weather and traffic.

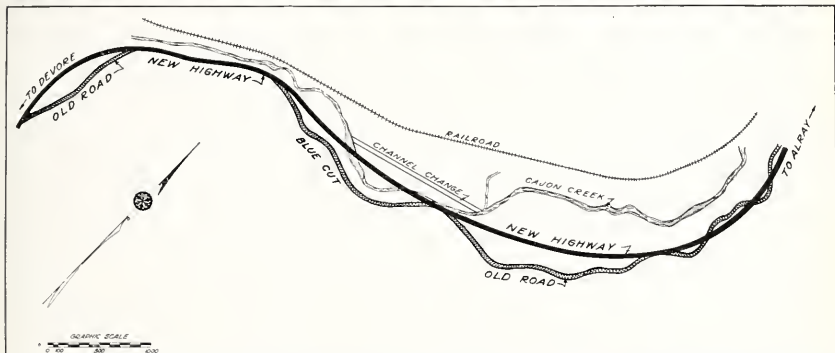
Mountain Playground

These factors will be especially appreciated in the winter when thousands of cars crowd the pass on week-ends bound for the snow sports at Big Pines, the Los Angeles County mountain playground to which the pass affords most direct access. The new highway will also eliminate the famous Blue Cut slide that has been a menace to travel and a blockade point for many years. This Blue Cut slide is a towering mass of crushed material of beautiful blue-green color, a result of the San Andreas Fault. So unstable is this mass that every rain brings down fresh slides on to the highway, narrowing and frequently entirely blocking the road. For many years the slide has been the cause of considerable expense for extra work entailed in keeping the highway open to traffic.

Moving a Creek

To cure this condition a major surgical operation will be performed upon Cajon Creek, which flows down through the pass. At Blue Cut slide the pass narrows, with the Santa Fe tracks occupying one bank of the creek and the highway running above the other.

Under the plans for the highway improvements the creek will be shifted into a new channel and the highway built on a fill across the old creek bed, thus placing the



CURVES ARE OUT of style with highway engineers, particularly the old-fashioned hairpin variety. Accordingly Cajon Pass, famous southern California gateway for transcontinental traffic through the mountains into the San Bernardino-Los Angeles areas, is to get a utilitarian beauty treatment from the highway doctors by which its curves will be reduced from ninety-one to thirty-two. The operation involves moving Cajon Creek out of its channel to permit location of the new highway a safe distance from Blue Cut slide, a mountainous mass of soft material that for years has been a menace to traffic, washing down upon the road during every rainstorm. The upper picture shows the new route near the slide, indicated by arrow. The diagram map shows the general route eliminating many curves and the location where Cajon Creek will be moved.

road at a safe distance of several hundred feet from the slide.

Then no longer will every rain bring a call from the Blue Cut slide for the maintenance crews to come and pull cars through the muck and rock debris blocking the road.

If, as an optometrist estimates, 72 per cent of the American people suffer from eye strain, it probably is due to looking for a place to park.—*Macon Journal*.

ROAD INTO ALASKA

From an engineering standpoint construction of roads in British Columbia and the Pacific Coast States in the proposed International Highway, is a feasible project. This is the statement of George Black, Canadian legislator and chairman of the Canadian-American Alaska Highway Committee. Existing roads in British Columbia and the Pacific Coast States form part of the proposed highway, eventually to be extended into South America.

Six Southern Delegations Heard by Highway Commission in Los Angeles

THE CALIFORNIA Highway Commission held its regular December meeting in Los Angeles on Friday, December 11, the second meeting in southern California following the first one held in San Diego in October.

Six delegations from various sections of the Southland and one from the North appeared before Commissioners Earl Lee Kelly of Redding, chairman; Timothy A. Reardon of San Francisco; Phillip A. Stanton of Anaheim; Harry A. Hopkins of Taft and Frank A. Tetley of Riverside. Sitting with the Commission were Colonel Walter E. Garrison, Director of Public Works; C. H. Purcell, State Highway Engineer; C. C. Carleton, Chief of the Division of Contracts and Rights of Way; District Engineer, S. V. Cortelyou of District VII and District Engineer, E. E. Wallace of District VI.

With the Commission's meetings open to the general public a number of citizens attended as spectators as was the case at San Diego and the hall on the second floor of Los Angeles headquarters in the Associated Realty Building was a busy scene from 10 a.m. to 5 p.m. with delegations and spectators coming and going.

JOINT HIGHWAY PROJECT

A delegation from Alameda and Contra Costa counties representing Joint Highway District No. 13 organized for the construction of a highway from Oakland with a tunnel at the Contra Costa County line asked a reconfirmation of an agreement for a \$300,000 State contribution to the project made when the district was organized. The delegation consisted of Redmond C. Staats, president of the district; Oscar Olsson, secretary; H. L. Hinman, treasurer; Archibald B. Tinning, attorney; George A. Posey, engineer and Ralph R. Arnold, associate engineer. On motion of Commissioner Reardon the Commission made \$150,000 available when the district is ready to commence work and the balance at a later date.

A delegation including Speed B. Leas, Cal. H. Antrim and F. M. Stuart of Fresno submitted figures for rights of way, relocation of a canal and construction of a turn-out on

the proposed State highway realignment between Fancher Creek and the southerly limits of the city on the railroad routing. As the figures came within the amount set as the maximum for that route as compared with an alternative route, the railroad routing was adopted on motion of Commissioner Hopkins.

ACTION DEFERRED

Mayor John Knox of Santa Monica, Mayor M. J. Johnson of Newport Beach, J. P. Greeley and Lew Wallace directors of the Newport Chamber of Commerce asked the Commission to arrange for the early beginning of construction on the highway and grade separation known as The Arches or Branagan Crossing at Newport Beach. The project is at the junction of the Coast Highway and the extension of Route 43 to Newport Beach and has been planned as a cooperative project with State, city and county participating. Mayor Johnson said the city could furnish the State with right of way but could not contribute funds. Action on the matter was accordingly deferred pending agreement on a new basis of cooperation.

A delegation headed by Mayor Clark of Redondo and including City Engineer Leonard of Torrance, Miss Smith of Lomita, Clifford Reid of Redondo, Ralph Graham, Mrs. Parkhurst and Miss Parkins of Wilmington appeared to inform the Commission that 85 per cent of the 100-foot right of way for the cooperative paying of State street between Wilmington, Lomita and Redondo had been secured and urging beginning of work. They were advised it was necessary for the cities to secure total right of way before the State could fulfill its obligation.

ALIGNMENT SOUGHT

Guy E. Leonard and R. V. Bashore of Bellflower asked the adoption of the Somerset avenue alignment through Bellflower in the event the connecting road link from Long Beach to Foothill Boulevard, east of Pasadena, is recommended to the Legislature for inclusion in the secondary road system.

A. C. Hardison and John Thille representing the Santa Clara Water Conservation dis-

New Acts Give Highway Rights Over School Lands; Other Procedure Aided

By FRANK B. DURKEE, General Right of Way Agent

THE RIGHT OF WAY Division in recent months has moved forward in several directions in its never-ending effort to acquire adequate rights of way for California State highways. Statutory authority now exists for the first time for grants of right of way across State school lands; procedure for acquiring easements over lands in probate has been shortened and made less expensive; advantage is being taken of Federal legislation to secure reservations of the public domain for highway purposes; securing of permits for rights of way within the national forests has been simplified.

In the first two instances, the procedure is based on acts of the Legislature which were approved by Governor James Rolph, Jr., last spring: 1. Acquisition of school lands for highway purposes. (Statutes of 1931, Chapter 672; Important Statutes, page 255.) 2. Dedication of property for highway purposes by executors, administrators and guardians (Sections 587 and 1515 of the Probate Code; Statutes of 1931, Chapter 1046, Important Statutes, page 256).

OVER SCHOOL LANDS

To understand the situation which has existed heretofore with reference to State school land, it should be borne in mind that these lands are grants to the State of Federal lands for the purpose of sale for the benefit of the common schools.

It has been the practice heretofore to construct State highways across school lands without authority. No definite width of right of way was secured because there was no means by which one might be obtained. Maps were filed with the Surveyor General to give notice of construction, but he had no authority to dispose of such lands except by outright sale to individual purchasers. He had no authority to make grants of either the fee or an easement to any department of the State government.

The statute referred to above authorizes the Division of State Lands, of the Department of Finance, to grant easements and rights of way to the Department of Public Works to or over the State's school lands "for the purposes of rights of way for high-

ways and for use in protecting highways from damage or destruction by natural forces."

NECESSARY PROCEDURE

A form of application, to be accompanied by the necessary descriptions and maps, has been agreed upon by the two departments concerned and the procedure to be followed in filing applications was outlined in a memorandum sent to all District Engineers and District Right of Way Agents, in October, 1931. The application must set forth a definite width of right of way defined by a center line description tied into a section corner.

The easements to be acquired will be executed by the Chief of the Division of Lands and will be placed of record the same as other similar grants of right of way acquired by the Department. Any patents issued upon the subsequent sale of the parcels crossed by a right of way so acquired will set forth the State's easement as a reservation.

Such reservation of the right of way in subsequent patents should obviate future disputes with school land purchasers over highway boundaries and widths, since such easements are now granted under statutory authority and hereafter will be a matter of record in the respective counties and in the Division of Lands as well.

CLEAR UP TITLES

Division Engineers have been urged to review all existing State highway in their respective divisions and to make application as soon as possible for right of way over any parcels of school land crossed by completed construction.

A number of applications already are on file with the Division of State Lands which has assured the Department of its desire to cooperate to clear up titles to highway right of way across all school land areas under its jurisdiction. Future construction, of course, may be similarly cleared as the highway program progresses.

The importance of this statute may be judged when it is understood that the State of California is the owner of approximately 750,000 acres of unsold school lands.

(Continued on page 36)

State Research Experts Develop Durable Traffic Line Paint Formula

By THOMAS E. STANTON, JR., Materials and Research Engineer

THERE is nothing which gives more comfort to the expert as well as the timid driver on our highways, day or night, than the traffic stripe which directs traffic along well defined lanes and which has caused such a unanimous demand on the part of the motoring public for more and better stripes that the Maintenance Department of the Division of Highways, under the direction of Maintenance Engineer T. H. Dennis, is now spending close to one hundred thousand dollars a year for this purpose alone.

The average layman looks upon the problem of maintaining such a stripe as comparatively simple and inexpensive.

It is true that the mechanical problems involved in the economical construction of the line have reached a high degree of perfection and that with a relatively small and inexpensive outfit it is now possible to apply many miles of a neat and accurately aligned stripe per day at a very low cost.

The labor of painting the stripe, however, represents less than 20 per cent of the entire cost, the other 80 per cent being the cost of the paint.

Not only does the paint constitute the great bulk of the cost of striping but so also does this material constitute the biggest problem the highway engineer has to face because it must have certain well-defined characteristics to make it of value for the purpose.

DRIES QUICKLY

In the first place, it must dry to such an extent in approximately one-half hour or less that it will not be injured by traffic. This accelerated drying requires that the lacquer type of paint be used instead of any of the well known oil paints, the quality of which have been developed to a high stage through

the use of now well understood standard high grade materials and methods of manufacture.

The use of oil, however, makes the paint slow drying and this drying time can not be shortened to the extent required for traffic lines without injury to the paint.

As a substitute for the oil paint there has, during recent years, been an extensive develop-

ment and use of the lacquer type wherever accelerated drying is desired such as for example in painting automobiles, furniture and traffic stripes.

The lacquer vehicle in which the white or colored pigment is ground consists of a nitro cellulose or a gum dissolved in some highly volatile solvent such as alcohol, benzol, acetone, etc. When spread on a surface in a thin sheet the solvent evaporates rapidly and leaves a hard residue.

Some solvents dissolve asphalt and, therefore, this type of solvent can not be used in the manufacture of traffic lacquers.

PAINT FLAKES OFF

Some gums leave a brittle residue which flakes readily after evaporation of the solvent. This type of gum can

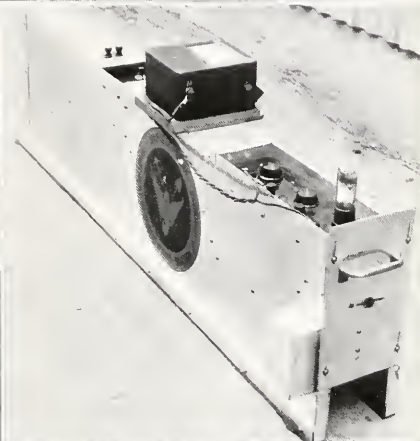
not be used unless it is possible to add some ingredient which will act as a toughener. Any such adulteration produces a slower drying material and when used to excess may so lengthen the drying time as to render the product unusable as a traffic lacquer.

On the other hand, the residue, after the solvent has evaporated, must not be soft or sticky in the slightest degree; otherwise it will be readily discolored by dirt, grease and oil from the traffic which passes over it.

The residue must also be highly resistant to abrasive action, otherwise it will wear out in three to six months time and rapidly lose its value as a safety guide, thereby requiring



THOMAS E. STANTON, JR.



STUDYING WHITE LINES calls for chemical research and inventive genius. In the top picture, Retla Alter, junior testing engineer at the Department of Public Works laboratory, is shown directing lamp rays into the aperture at bottom of an apparatus he designed for testing the light-reflecting properties of different paints used for striping traffic lines. Fred T. Maddocks, senior engineer, is reading and recording measurements shown by meter dials. Below at right is a close-up of the apparatus revealing some of the electrical equipment that records light-reflecting properties by means of a photo-electric cell. Below is an abrasion meter apparatus. At left is a view of the broad white lines on Foothill Boulevard in Los Angeles County and below traffic is seen using the lanes on Bayshore Highway, San Mateo County.



Two Camps for the Unemployed Opened by Department of Public Works

AT THE INSTANCE of Governor Rolph a new departure in relief employment work has been started this month by the Division of Highways with the establishment of two camps for men who are willing to do part-time work for their meals and board. Each of the camps will care for 250 men and is located where the men can be used at hand labor on highway construction.

The first camp was started in Plumas County at Rich in the Feather River Canyon, using buildings that were put up last year for the relief employment camp at this point. The camp is operated by the State and the men are used in extending the work which was opened by the previous camp. Superintendent A. N. Lund, who directed this camp last year, is in charge with a small crew of regular foremen to supervise the work.

ON TOPOCK ROAD

The second camp is in San Bernardino County between Needles and Topock on State Route 58. In this camp the housing and feeding is being handled by a supply company of Los Angeles under contract with the State. The camp is in charge of Superintendent E. S. Gripper who handled the relief camp in Arroyo Seco near Los Angeles last year. The men are being used to widen cuts and improve the alignment on the highway near the camp.

Men for the Rich camp are being furnished by the City of San Francisco, and the City of Los Angeles is sending out the men for the Needles location. Under the agreements made by Col. Walter E. Garrison for the Division of Highways with the officials of these places, the cities are picking the men for the camps, paying their transportation to the camps, are responsible for medical care in case of sickness, and furnish clothing to needy cases. **The men must be American citizens and go to the camps voluntarily. The State uses the men for six hours a day on highway work and gives them their meals and board and an issue of tobacco. If a man does not work he is dropped from the camp.**

QUARTERS HEATED

The Rich camp is entirely of wood construction and the men are housed sixteen to a room.

The Needles camp is of tent construction with wood floors and side walls screened at the top, the quarters earing for eight men to a tent. In both camps the quarters are heated with stoves and electric lighted. Each man is given a spring cot, mattress, blankets, sheet blanket and pillow. **Hot showers are provided with stationary tubs for washing clothes. The State maintains a man in the camp who is a registered nurse competent to administer first aid in case of accident and attend to the minor troubles of the men. The meals are of the standard served in all State camps, of good wholesome food and well cooked.**

WILLING HANDS

With conditions in California better than in other parts of the country, and men figuring that they may be hungry but they will not freeze when they get here, there has been an enormous increase this year in the number of transient laborers entering the State who flock to the cities and become dependent on the free kitchens for their existence. A large percentage of these men are able and willing to work if they can only get the chance and it is for this type that the camps have been established. No one camp can begin to meet the problem that has developed, but similar camps are being operated by the cities and the State Department of Forestry; it is hoped that the combined efforts will result that men who are willing to work will not suffer.

NEW SIGNS PLACED

Since the new law became effective August 14, more than 2100 new State speed limit signs have been put in place by the signposting department of the Automobile Club of Southern California, it is revealed in a report just issued. These markers so far have been posted in 57 different communities or counties which have ordered them to date. In this special job more than 13,000 miles of highway have been covered by a fleet of 10 trucks engaged in this rush work to inform motorists of the new 20-25 and 45-mile speed limit regulations.

First Contractor: "I've just arranged to give a man \$3,000 if he will take all my worries off my hands."

Second Contractor: "That ought to be fine, but where are you going to get \$3,000 in this day and time for that?"

First Contractor: "Well that will be the first thing he will have to worry about."



IN A SCENIC PARADISE, the labor camp for unemployed at Rich is located on the banks of the Feather River. Opened and maintained by the Department of Public Works, the men have comfortable quarters in substantial, heated two-story bunk houses close to their highway work.

Experts Develop Durable Traffic Line Paint Formula

(Continued from page 8)

renewals at two or three times the ultimate cost per year of a line painted with a high grade, non-brittle abrasion-resisting lacquer which retains a high degree of visibility from nine months to a year.

RENEWAL PERIODS

Practically all lines where traffic is reasonably heavy require renewal in from nine months to a year. In many cases, where the traffic is exceptionally heavy and consists of a large percentage of truck traffic, renewals must frequently be made at intervals of three to six months.

The traffic line should also retain its color throughout its life. Thus, if a white line is desired it should remain white and not change to a yellow or dirty color through the action of the sun and other natural elements.

Because the use of lacquers for traffic lines is a comparatively recent development and no standard specifications have as yet been formulated which will insure a material complying with all of the desirable characteristics outlined above, the Materials and Research Department of the California Division of Highways has been conducting an extensive research of this problem for some

time. As a result of this investigational work a standard lacquer specification has been developed which, it is expected, will insure a high grade product with the resultant saving of thousands of dollars in cost and increase in utility.

G. H. P. Lichthardt, chief chemist at the laboratory, who is highly expert in his profession, has been carrying on an extensive investigation into the relative value of the commercially available gums and the proper solvents which must be used with these gums. Under Lichthardt's direction extensive tests have been made of the abrasive resistance of different lacquers when tested on the abrasion machine constructed at the laboratory.

To pass the specifications drawn up by Lichthardt, lacquer must not only pass a severe abrasive test, but must dry in from 15 to 30 minutes, have good flowage and covering properties, resist cracking under a severe bend test, resist disintegration in water and must not dissolve the asphalt in the pavement surface.

Further investigations have been conducted by Retla Alter of the laboratory staff to devise equipment for measuring the relative visibility of different surfaces by means of the photo electric cell. Very encouraging progress has been made in the development of equipment for this purpose which it is hoped may be perfected to such an extent that information of value can be secured which will enable a more intelligent selection to be made of the material best suited for specific cases.

Highways Not a "Cost of Government"

(Continued from page 1)

The gas tax does not become a burdensome surplus. It is not permitted to become an object of manipulation in the money market. It is cheerfully paid by the people, and then quickly returned to them in improvements.

Increasing demands for improved highways as well as the vast obligations already assumed by the State, render utterly untenable any proposition that, directly or indirectly, would reduce full gas tax accruals to the Highway Division.

The gas tax carries no bond interest. The roads go forward on a cash basis. There is an orderly plan working toward an ultimately completed system. There is a daily solvency of funds and a frank, open accounting with a satisfied public.

Highway expenditures are not a "cost of government"; they are for improvements aided by all and essential to the life of the State. The pay-as-you-go plan lays no burdens on the property of today or tomorrow. The disbursing of 85% of these millions to the ultimate laborer pays but does not increase taxes. An alert public opinion will continue to assure an undivided gas tax to the highways of California.

SOME BIG JOBS

Some of the outstanding features of the construction program during 1931 are of state-wide interest. On the Ridge Route alternate, Los Angeles County, the highway connecting Southern California with the San Joaquin Valley, between Castaic School and Tejon Pass and following the canyon to the west of the present road—work has progressed steadily. This section of the existing Ridge Route is 36.5 miles in length.

The new alignment will reduce it to 27 miles. Seven miles of grading has been accomplished. The new route will have large radius curves and easier grades. The grading is underway on the remaining 20 miles. Some idea of the immensity of this job may be indicated in the fact that it involves the moving of 4,000,000 cubic yards of earth in a mountainous region.

Another big job is the San Juan Grade alternate, in Monterey and San Benito counties. This is a link in the coast road connecting Los Angeles and San Francisco. It involves construction from 2 miles north of

Salinas to the Pajaro River, passing through San Miguel and Langley canyons. The existing road via San Juan Grade is 18 miles.

INCLUDES TWO BRIDGES

The new route will be only 16.6 miles and will be a vast improvement both in alignment and grades. The construction includes grading, paving and the building of two bridges. The work will be completed in 1932. The contract involves the moving of 800,000 cubic yards of earth and placing about 41,000 cubic yards of Portland cement concrete pavement.

On the Redwood Highway between Sausalito and San Rafael, Marin County, the Alto to Waldo link is the scene of interesting construction. The new line obviates the use of the Corte Madera Grade. This latter section was open to traffic November 22, 1931. The construction involved the building of an overhead crossing and bridge above the tracks of the Northwestern Pacific Railroad and across an arm of Richardson Bay; the construction of new road bed and the placing of bituminous macadam pavement. The unstable marsh lands adjacent to the bay necessitated the use of tons of dynamite to blast away the muck in order that a firm foundation could be found for the exceedingly heavy fills.

BUILDING LONG TUNNEL

The Newcastle tunnel on the Sacramento-Truckee road is an improvement of outstanding interest. It provides for a realignment of the highway at Newcastle by tunnelling under and through the solid granite hill on which the town is situated. The tunnel is 531 feet long. It has a 30-foot width pavement and a 3-foot sidewalk on either side. The tunnel is 21 feet high and is lined with Portland concrete cement. It eliminates one of the most tedious and dangerous points on the highway.

Another scheduled job on the Sacramento-Truckee road is that of the Gold Run to Airport link in Placer County. This is a new alignment between Gold Run and the Airport west of Emigrant Gap. The project will be the last link in the modernizing of the old pioneer trail into California via Donner Summit. It will run to the southeast of the present highway and follow the course of Canyon Creek and will be 11.5 miles in length. The bids for grading on this project were

(Continued on page 29)

Figures Tell Story of Year's Work

Last January Governor Rolph gave the command "full speed ahead." The Department of Public Works responded at once. The mechanism of its vast organization was set in motion. There has not been a let down of pressure during the year. Public improvements for the people and tens of millions of dollars distributed to labor have won public approval. All records have been broken. In the face of the "depression," the Department has built more highways, more new buildings and done more work of all kinds than in any other year. Eighty per cent of the cost has been met by the gas tax. The turnover has been rapid. Last month's tax pays for this month's work.

Here are some facts worth remembering:

Employed directly through departmental activities.....	46,000
Total business by Highway and Architectural divisions....	\$50,779,617

DIVISION OF HIGHWAYS

Work contracted and under way.....	\$24,648,200
Work awarded during December.....	1,593,200
Work carried over from 1931.....	9,402,600
Work, maintenance, all kinds.....	6,910,000

Highway Division grand total.....	\$42,554,000
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MILEAGE RECORD FOR 1931

Asphalt concrete pavement.....	75 miles
Portland cement pavement.....	138 miles
Bituminous macadam pavement.....	7 miles
Bituminous crushed rock pavement.....	454 miles
Untreated crushed rock pavement.....	59 miles
Graded and prepared.....	70 miles
Total completed, progressing or contracted.....	803 miles

DIVISION OF ARCHITECTURE

Work let to contract in December.....	\$1,194,000
Work completed by December 16, 115 projects.....	4,420,098
Total construction (Jan. 1-Dec. 31—177 projects).....	8,225,617

DIVISION OF WATER RESOURCES

Estimated cost of private or corporate dams approved or supervised.....	\$19,000,000
New dams approved.....	50
Enlargements authorized.....	11

Highway work is on a pay-as-you go basis. It is not money collected by the tax collector; it bears no interest and does not lie idle in vaults. As fast as it accrues, it is put back in circulation, 85 per cent of it going ultimately to labor.

By-Pass Considered Logical Plan for Routing Through Traffic in Cities

By **FRED J. GRUMM**, Engineer of Surveys and Plans

When through traffic meets local traffic, then comes the tug of war—paraphrasing the old saw about the Greeks. The conflict is seen at the gates of every city, with resultant congestion where both classes of traffic are crowded into "Main Street." This perplexing problem of routing through traffic in urban areas and the relationship of the State Division of Highways and local planning bodies in solving it are discussed in the following paper delivered before the California League of Municipalities at Del Monte.

IN PLATO'S utopian scheme of government there was not included, to my recollection, a plan of the ideal city. Of course such concrete considerations should probably not be included in an abstract dream. Nevertheless, Plato's time would have been none too early to organize a planning commission, and it might have induced earlier and more earnest consideration of the problem.

Any planner today knows that in his planning work hindsight is not better than foresight. It may be easier to recognize the needs or more simple to decide what facilities will satisfy them, but it is more difficult to supply the solution and much more costly.

Like many other difficult problems, the problem of planning can be more readily solved by cooperation of the various agencies on whom these duties devolve. Especially so where responsibilities overlap, where the city and county or the State's obligations meet—and that is quite frequently.

CONFLICTING STREAMS

To plan for the State-wide traffic in the open country is relatively simple, but it is in the urban and city areas that all of the various organizations must work together to supply the necessary facilities. It is here that through traffic which has moved freely along the open highway begins to meet and mingle with the local traffic gradually accumulated by the main highway. It is at this point that the accumulation of traffic begins to present the more perplexing problems, where the travel artery

must function to satisfy various requirements, and the problem does not diminish in complexities as traffic reaches the streets and avenues of the city.

Let us consider these various classes of traffic and their needs. Generally we may speak of two classes: local and through traffic. Other kinds are substantially grouped under these two general classes, at least, their characteristics are essentially similar to those which can be ascribed to either local or through traffic.

LOCAL TRAFFIC DEMANDS

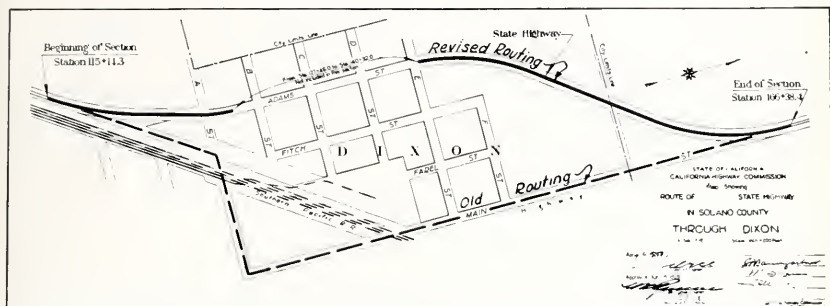
Requirements of local traffic, the operation of vehicles in the transaction of business within communities, are decidedly different from those of through traffic. Local traffic wants to transact business at the establishments fronting on the thoroughfares. It moves slowly for shorter distances, enters and departs from parking areas in front of such establishments. Through traffic wishes to proceed speedily, directly and unmolested on its way.

The merchants and business men of a community are dependent on the people in that community and the surrounding territory for support. These people are their customers. They constitute the local traffic. How many pairs of shoes does the merchant in Salinas or Fresno sell to the motorist traveling from San Francisco to Los Angeles? How many pounds of sugar the grocer, or even nuts and bolts, which might be used on a car, does the hardware merchant dispose of to the man driving through town?

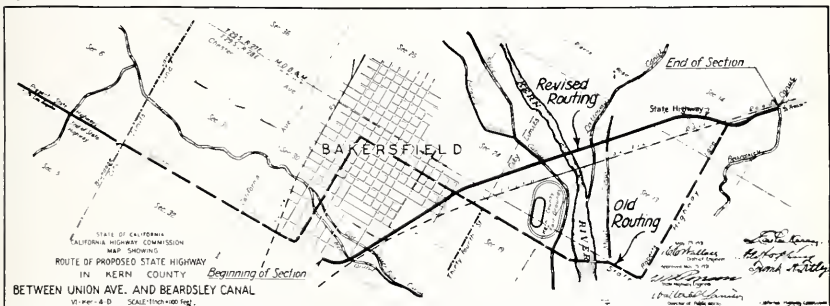


FRED J. GRUMM

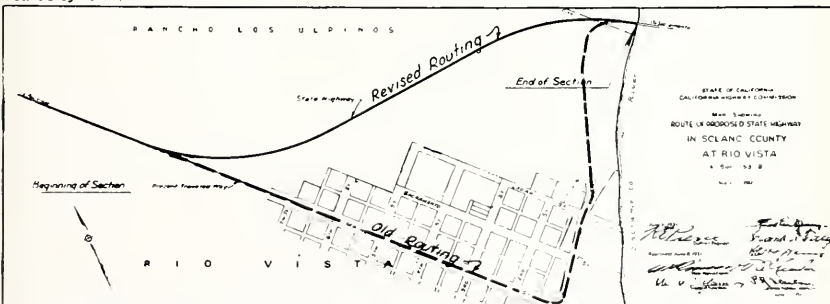
Revised Routes in Three Municipalities



THE OLD STATE HIGHWAY brought traffic into Main Street of the city of Dixon, Solano County, in a roundabout way necessitating two crossings of the Southern Pacific railroad tracks. The new route opened last year avoids the railroad tracks and Main Street and leads traffic through town by way of Adams Street.



THE PRESENT STATE HIGHWAY into Bakersfield leads from Union Avenue with a right-hand turn into the heart of the city where another right-hand turn is made. The proposed routing as shown above skirts the thickly built section and leads in an almost straight line from Union Avenue to the Beardsley Canal.



AT RIO VISTA in Solano County the through traffic to Sacramento that now goes through Main Street will by-pass the town in the new routing which has been accepted by all parties concerned. Work will begin in the Spring.

Donner Yearly Snow Averages 25 Feet

(Continued from page 2)

present year between Airport and Soda Springs made practical the consideration of keeping this road open between storms during the present winter. Donner Summit is 7135 feet above sea level, and extremely heavy snowfall and severe weather conditions may be expected any winter.

The snowfall area extends from west of Colfax to the California-Nevada State line, a total distance of nearly 90 miles. The elevation varies from 2500 feet at Colfax to 7135 feet at Donner Summit, and 5125 feet at the State line. Records of snowfall during the past sixty years show a maximum season's fall of 783 inches in 1879 to 1880, a minimum of 145 inches in 1880 to 1881, and 402 inches as an average winter fall for the entire period. A study of these records shows that some twenty to twenty-five feet of snowfall may be expected even in moderate winters.

There are records of snow falling at a rate of eight inches an hour at the higher altitudes and, if such a snowfall is accompanied by a wind of high velocity and low air temperatures, the situation becomes hazardous for anyone stranded in that area. From Colfax to Truckee accommodations for the traveling public are limited, particularly during the winter season. Although Emigrant Gap and Norden are railroad stations and there is a hotel at Soda Springs, accommodation could naturally not be expected for any large number of snowbound travelers.



Auger blower type heavy duty plow widening cut through deep drift during storm on the Summit.

Any attempt to keep such a road open was impracticable, since even if the snow was removed it would not have been feasible to maintain the surface in condition for traffic.

Each season has seen an advance in the reconstruction of this road to higher standards. The plans of each project were reviewed with the thought to provide a road section most favorable for snow removal work. Wherever possible the grade was established sufficiently above the adjoining surface so that advantage could be taken of the scouring action of the wind. Where it was necessary to go through cuts, the normal ditch section was widened and storage space thus provided for the snow which would be pushed off the traveled way.

This widened ditch section also provides additional drainage when the snow melts, thus aiding in the upkeep of the road. As mentioned previously, the surfacing placed on the road must be adequate not only to carry traffic, but support the heavy snow removal equipment with a minimum of winter maintenance. In addition, the shoulders beyond the pavement must be of crushed rock to permit equipment to operate off the pavement when clearing snow.

One Poor Unit

There still remains one unit not yet constructed to present day standards. This section is approximately twelve miles long, extending from Gold Run to Airport. The alignment is fair and a good oil surface has gradually been developed under maintenance which will carry traffic until the unit is reconstructed, starting early next year. However, the width and slopes make removal operations on this section more difficult than elsewhere on the road.

Snow removal work requires not only proper equipment and organization, but also proper facilities for caring for both men and equipment. The cold weather and constant strain from removing wet or frozen snow causes frequent breakdowns of equipment. Lack of repair facilities and spare parts at



Front view of an auger blower type rotary plow boring its way through the drifts on the Donner Grade.

Plan Made Feasible

An appreciation of these facts has caused the Maintenance Department to approach the problem with care and without undue optimism as to the ease of the task. As indicated above, information has been collected and experience gained during the past five years, anticipating the time when the work might be undertaken with fair prospects of success. When the plan was first considered, the road was of a comparatively low standard. It was unsurfaced, with sharp curves, steep grades, and many miles of narrow roadway.

Crews and Motors Man Four Stations

(Continued from preceding page)



Rear view of auger blower rotary clearing a wide swath through the Donner Summit forests.

the scene of action means a snow-blocked road. This side of the work has been brought forcibly to attention during several storms of the past two winter seasons.

The housing and shop facilities now available to carry on the work on this road are as follows:

COLFAX—At Colfax there is the regular maintenance station, which is headquarters for the Maintenance Superintendent. There is a standard bunk house and office and an eight-stall truck shed with oil house and blacksmith shop.

Truck Shed Heated

EMIGRANT GAP—At Yuba Pass Station, three miles east of Emigrant Gap, there is a truck shed 40' by 143' in size and a bunk house capable of housing sixteen men. The truck shed is sealed and a steam heating plant installed to heat not only the bunk house but the truck shed as well. Provision for making minor repairs to equipment is included in the truck shed layout at this point.

DONNER SUMMIT—The main headquarters of the snow removal work is located at Donner Summit about seventeen miles from the Yuba Pass maintenance site. The truck shed at this point is of the roundhouse type and includes a repair shop with pits and tools to handle major equipment repairs. A sixteen-man bunk house, similar to the Yuba pass layout, is connected to the truck shed by a covered passage. Both of these buildings are constructed to withstand the coldest weather and are steam heated.

TRUCKEE—At the Truckee Maintenance Station there is a 30' by 100' truck shed with steam heating plant, a standard oil house, and dwelling which is used as a bunk house.

The snow removal on the section of road from west of Colfax and east to Airport is handled from the Colfax site. The equipment assigned here consists of two 3½-ton trucks equipped with 10 foot straight blade push plows, and a dual drive tractor grader equipped with a 10-foot grader blade and "V" type plow.

Heavy Equipment

The crew at the Yuba Pass Station removes snow from Airport to a point midway between that station and Donner Summit. Their present equipment consists of one "V" type and two straight blade speed plows mounted on heavy four-wheel drive trucks, as well as one auger blower type of plow mounted on a 5-ton four-wheel drive truck.

The outfit at Donner Summit handles the section from nine miles west of the summit to the junction with the Tahoe City road, a short distance west of Truckee. The equipment here consists of one "V" type and two straight blade one-way speed plows, all mounted on 3½ ton four-wheel drive trucks, together with a shovel type rotary plow with "V" type blade mounted on a four-wheel drive truck and, in addition, an auger blower type of plow similarly mounted.

The Truckee crew removes snow on the section of road immediately west from Truckee to the State line and, in addition, takes care of the road between Truckee and Tahoe City, as well as a portion south of Tahoe City on the west side of Lake Tahoe. A truck shed and living quarters are also available at Tahoe City as an auxiliary to the Truckee layout. The equipment operated out of Truckee consists of two straight blade push plows and one shovel type rotary plow, all mounted on 3½ ton trucks.

Start With Storm

Effective snow removal work requires that the equipment start with the storm and continue until

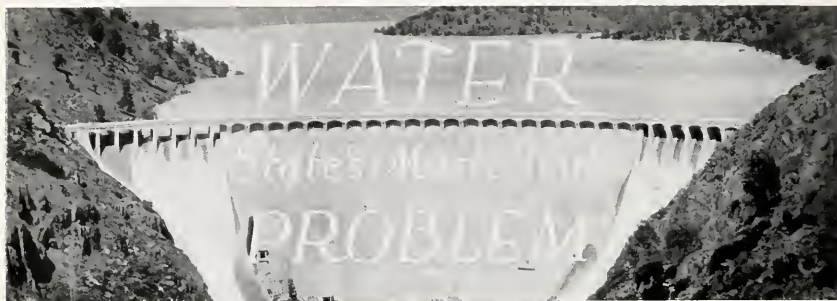


Shovel rotary type truck plow doing its stuff on the Ridge Route near Caswells in Los Angeles County.

the storm has ceased and the road is clear. This means that the crews must be ready and equipment serviced, all in readiness for continuous operation for the duration of the storm. This fact accounts for the care and expense taken for the comfort of the men and facilities for housing and care of equipment.

Early in November, two sets of gates were erected across the highway—one at Airport and one just west of Truckee. Watchmen's shanties were in place

(Continued on page 38)



This is the fifth of a series of articles on the State's water problem. The first dealt with Governor Rolph's call for the united efforts of all sections of the State to help reach a solution. The second, third and fourth articles described, respectively, the situation in Sacramento Valley, Sacramento-San Joaquin Delta, Los Angeles and San Joaquin Valley regions. This is the first installment of the article discussing estimated costs of the immediate initial and complete initial developments of the State Water Plan for the Sacramento-San Joaquin Valley project. The second installment, dealing with the anticipated revenues and possible methods of financing the project, will appear in the next issue.

By A. D. EDMONSTON, Deputy State Engineer

IN EVOLVING a program for any project, whether it be a private or public enterprise, the financial feature is generally most important and one which should be most closely scrutinized. The capital and annual costs of the project and the anticipated revenues therefrom which would accrue to the project from its inception to the time when the project would be completely paid for are highly important and necessary features which should be ascertained as accurately as possible before the project is declared economically sound and financially feasible.

In Bulletin No. 25, "A report to the Legislature of 1931 on State Water Plan," issued by the Division of Water Resources of State Department of Public Works, and prepared under the direction of Col. Walter E. Garrison, Director of Public Works and Edward Hyatt, State Engineer, three projects are proposed for immediate development, namely; Colorado River Aqueduct, as outlined by the Metropolitan Water District of Southern California, Santa Ana River project and Great Central Valley (Sacramento-San Joaquin Valleys) project.

PROJECTS ADVANCED

Steps have been taken toward the construction of the first two projects. The Metro-

politan Water District of Southern California, on September 29, 1931, voted bonds in the sum of \$220,000,000 to bring water from the Colorado River. The Legislature of 1931, appropriated \$400,000 of state money to be matched by funds from San Bernardino, Riverside and Orange counties which would be used for the conservation and utilization of the flood waters of the Santa Ana River and its tributaries and for flood protection.

The California Water Resources Commission, appointed by Governor James Rolph, Jr., and the Joint Legislative Water Committee are studying the financial as well as other phases of the State Water Plan, including those of the Great Central Valley (Sacramento-San Joaquin Valleys) project. In this article, the discussion will be confined to the financial aspects of the latter project.

The project proposed for initial development in the Great Central Valley has been set up as a progressive development. It has been proposed to finance the entire project but defer construction of two of the units until such time as it may be necessary and desirable to build them. The first step is designated as the immediate initial development and the next step, which includes the two deferred units as the complete initial development.

Initial Water Plan Cost Estimates

(Continued from preceding page)

IMMEDIATE UNITS

The construction and operation of the units proposed for immediate development would solve the navigation and irrigation problems on the Sacramento River, salinity problem in the Sacramento-San Joaquin Delta and water supply problem in the industrial and agricultural areas on the south shore of Suisun Bay and relieve the stress in the irrigated areas in the Upper San Joaquin Valley.

The construction of the two deferred units would permit the delivery of additional water supplies to the Upper San Joaquin Valley for replenishment of underground storage, for perfecting the supplies in those areas in which there has been a temporary deficiency in surface supplies and the expansion of irrigated acreage when desired. It also would afford an opportunity for the restoration of navigation on the San Joaquin River for a distance of more than 90 miles.

COST OF THE PROJECT

In estimating the cost of any project, two factors are of prime concern. One is the prices paid for construction materials, labor, rights of way and water rights, and the other, the cost of money which is borrowed to finance the project. The costs of the first items are of more importance than is the second in the effect on the capital or first cost, because they represent about nine-tenths of the total whereas the second item only represents about one-tenth because of the relatively short period of construction. On the other hand, the interest charges, after the completion of the project, represent from one-half to three-fourths of the total annual charges.

The estimated costs of the physical works for this project are based on the costs of labor and material which prevailed in 1928 and 1929 and are somewhat higher than those prevailing at the present time. The interest rate for state financing was assumed at $4\frac{1}{2}$ per cent per annum which is about $\frac{1}{2}$ per cent higher than the rate which has usually prevailed but is about the rate for recent State bond issues.

The items for the immediate and complete initial developments are shown in the following tabulation. The figures include 25 per cent of direct costs for overhead charges and contingencies and interest at $4\frac{1}{2}$ per cent per annum during the period of construction.

Item	Capital Cost	
	Immediate Initial Development	Complete Initial Development
Kennett Reservoir, dam and power plants.....	\$84,000,000	\$84,000,000
Sacramento-San Joaquin Delta Cross Channel (deferred).....	-----	4,000,000
Contra Costa County Conduit.....	2,500,000	2,500,000
San Joaquin River Pumping system (deferred).....	-----	15,000,000
Friant Reservoir, dam and power plant.....	15,500,000	14,500,000
Madera Canal.....	2,500,000	2,500,000
San Joaquin River-Kern County Canal.....	27,300,000	27,300,000
Magunden-Edison Pumping System.....	100,000	100,000
General Expense and Water Rights.....	7,000,000	7,000,000
Totals.....	\$138,900,000	\$157,900,000

In order to show the effect of different rates of interest on the capital cost of the project, the following tabulation has been prepared for six rates as follows:

Annual Rate of Interest in per cent	Capital Cost Without Deductions for State or Federal Contributions	
	Immediate Initial Development	Complete Initial Development
3	\$134,500,000	\$152,900,000
$3\frac{1}{2}$	136,000,000	154,700,000
4	137,400,000	156,200,000
$4\frac{1}{2}$	138,900,000	157,900,000
5	140,400,000	159,600,000
6	143,300,000	162,900,000

A review of the figures in the foregoing table shows that a saving of \$4,400,000 could be made in the capital cost of the immediate initial development if the interest rate were reduced from $4\frac{1}{2}$ to 3 per cent per annum and that there would be an added cost of \$4,400,000 if the interest rate were increased to 6 per cent per annum. These differences in capital cost due to the use of 3 and 6 per cent interest rates instead of $4\frac{1}{2}$ per cent, represent about 3 per cent of the capital cost based on a $4\frac{1}{2}$ per cent rate. The corresponding differences in the capital cost for the complete initial development represent about the same per cent.

FEDERAL-STATE CONTRIBUTIONS

The foregoing estimates of the project are gross total costs without allowances for contributions from any source. In connection with the Kennett unit, contributions from both the Federal and State Governments may well be expected. In House Document No. 791, 71st Congress, 3d session, the Chief of Engineers of the War Department, recommends that the Federal Government contribute \$6,000,000 directly to the construction of the Kennett Dam in the interest of navigation on the Sacramento River.

Additional contributions from the Federal Government in the interest of flood control on Sacramento River and navigation and flood control on San Joaquin River could be anticipated which would reduce further the capital cost of the project. Also, it is generally assumed that the cost of relocating the State Highway at the Kennett Reservoir would be paid out of State Highway funds. The estimated cost of this work is \$3,400,000. The capital costs of the project with deduction for probable Federal and State contributions totaling \$9,400,000 would be as follows:

Annual Rate of Interest in per cent	Capital Cost With Deduction for Federal and State Contributions	
	Immediate Initial Development	Complete Initial Development
3	\$125,100,000	\$143,500,000
$3\frac{1}{2}$	126,600,000	145,300,000
4	128,000,000	146,800,000
$4\frac{1}{2}$	129,500,000	148,500,000
5	131,000,000	150,200,000
6	133,900,000	153,500,000

ANNUAL COSTS

The annual costs in operating the project would include the following items:

1. Interest on invested capital.
2. Amortization of investment.
3. Depreciation of physical works.
4. Operation and maintenance charges.

(Continued on next page)

U. S. Contribution Set at \$6,000,000

(Continued from preceding page)

The gross annual costs for rates of interest varying from 3 to 6 per cent per annum are given in the following tabulation. It was assumed in estimating these annual costs that an aggregate direct contribution to the project of \$9,400,000 would be made by Federal and State governments and it was assumed also that sinking fund bonds would be issued, which would be amortized in 40 years.

Annual Rate of Sinking Fund Interest in per cent	Interest Rate in per cent	Gross Annual Cost (40-year Amortization Period)	
		Immediate Initial Development	Complete Initial Development
3	3	\$6,416,000	\$8,676,000
3½	3½	7,333,000	9,748,000
4	4	8,241,000	10,791,000
4½	4	8,982,000	11,660,000
5	4	9,737,000	12,543,000
6	4	11,284,000	14,345,000

In the foregoing estimates, the gross annual costs are based on sinking fund bonds which would be amortized over a period of 40 years after completion of the project. If the amortization period were extended over a longer time the annual cost of the project would be substantially reduced. The State constitution permits the issuance of State bonds for a maximum maturity of 75 years.

DEPRECIATION FUND

There are included also in the estimates, amounts for the depreciation of the physical works. These amounts vary with the lives of the respective structures, but in all cases, the sinking fund established would be adequate to replace any particular structure at the end of its estimated life.

By providing such a depreciation fund, it might be possible to omit the inclusion of the provision for amortization of the capital investment. Such a procedure, however, would result in the issuance of refunding bonds, which, in the case of financing by State bond issue, would require an amendment to the State constitution.

The following table gives the annual costs of both the immediate initial and complete initial developments, calculated on State financing at a 4½ per cent interest rate with 75-year sinking fund bonds amortized over a 70-year period, and with refunding bonds. Direct contribution of \$9,400,000 from Federal and State governments was considered to have been made.

	Capital Cost	Gross Annual Cost Interest at 4½ per cent and 75-year sinking fund bonds	
			Interest at 4½ per cent and refunding bonds
Immediate Initial development.	\$129,500,000	\$7,975,000	\$7,622,000
Complete Initial development.	148,500,000	10,505,000	10,101,000

After all, the difference between learning to drive a car and learning to play golf is simply that when you are learning to play golf you don't hit anything.
—Union Oil Bulletin.

First garage mechanic: "There was a fellow in here from Potter County with his car. He had an interesting story."

Second garage mechanic: "An old timer?"

First garage mechanic: "Naw, a new generator."—*Motor Land.*

Good Use Found For the Maligned Back-seat Driver

The back-seat driver, while regarded as a meddling nuisance by many motorists, has at last found a strong and authoritative champion.

This defender is no less than Dr. Miller McClinton, director of the Erskine Traffic Bureau at Harvard University and formerly of San Francisco, who says that the inactive driver provides "four eyes instead of two and two attentions instead of one."

The Erskine Traffic Bureau specializes in surveys of new problems growing out of the automobile in modern life. The director claims that increasing speeds and the steadily growing number of cars on the highways make more and more eyes necessary. But what is needed is coordination of the front and back-seat drivers.

They should develop teamwork, the director says. Instead of "razzing" the one at the wheel and shouting at him, the rear pilot should serve in an advisory capacity, if the best results are to be obtained from their combined faculties for safety.

Moynahan Assistant Highway Patrol Chief

George F. Moynahan, veteran member of the State traffic force and a police officer for more than twenty years, has assumed his duties as Assistant Chief of the California Highway Patrol.

Moynahan, whose appointment was made by Chief E. Raymond Cato with the approval of Daniel J. O'Brien, Director of the Department of Motor Vehicles, and confirmed by Governor James Rolph, Jr., succeeds H. R. Youngblood, resigned.

The appointment was promotional in character, Moynahan having been serving as Assistant Supervisor of Traffic.

"Is there any truth in the report that Angus McTavish bought the corner filling station?"

"Well, I don't know for sure, but the 'free air' sign has been taken down."

Santa Claus Gives Governor Rolph a Beautiful Airplane

GOVERNOR JAMES ROLPH, JR. stole the limelight from Santa Claus at the afternoon Christmas tree party given to the children of the Department of Public Works "family" and in the evening led the dance for the grown-ups with Mrs. Rolph as his partner.

Children are a never-failing source of delight for the Governor wherever and whenever he meets them and he in turn has a happy faculty of fraternizing with them like a jolly big brother. He helped Santa Claus despoil the big Christmas tree of its bright baubles, toys and candies and had a merry time handing out gifts to the "family" children numbering nearly a thousand.

SURPRISE FOR GOVERNOR

Then Santa Claus turned the tables on the Governor. Pushing aside the thickest branches of the tree he extricated a large blue and gold airplane and presented it to "Sunny" Jim. The sides of the plane were decorated with the name "James Rolph, Jr." The Governor was as surprised and happy as any of the kids. The arrangements and expenses of the festivities given at the Elks Temple were handled by a committee of 150 hosts and hostesses comprised of Department of Public Works officials and their wives. A women's committee of 20 supervised the children's party, buying and wrapping all the gifts, toys and candies and regaling the tots with all the ice cream they could eat. Excess toys and goodies were later given to charitable organizations. The tree and pine garland decorations were provided by the Donner Summit maintenance crew of snow fighters.

In the evening the older folks enjoyed themselves with dancing and cards till the wee small hours. The first annual Christmas Party of this "one big family" of the Department of Public Works will go down in history labeled "a great success" with earnest wishes for many happy returns of the day.

OVER HISTORIC ROUTE

Country dotted with crumbling ruins of stage line stations and post offices of the pony express era half a century ago will be made more accessible to motorists by Riverside county's newly announced highway program in the Aguanga-Anza-Temecula region.

Commission Allots Cooperative Funds to Several Projects

(Continued from page 6)

trict of Ventura County protested against the location of the alternate Ridge Route in Piru Canyon on the ground that it passes through the Piru reservoir dam site. Mr. Hardison was heard in detail at great length on the matter.

In response to a request from City Attorney D. B. Roberts of Holtville that the State contribute to the paving of a portion of Palm avenue on the State highway from Yuma to El Centro through Holtville, about a block in length, at an estimated cost of \$1,590 for a 24-foot pavement, the Commission agreed to cooperate to that amount on motion of Commissioner Tetley.

COOPERATION GRANTED

A request of the Commission of the city of Fresno for a cooperative contribution of \$70,000 as the State's share in the construction of a subway under Southern Pacific tracks at Belmont crossing presented by Jean Vincenz, Commissioner of Public Works was granted on motion of Commissioner Hopkins.

Preceding the Los Angeles meeting the directors of the Automobile Club of Southern California entertained Commissioners, Director of Public Works Garrison and State Highway Engineer Purcell at dinner in the club headquarters building on Thursday evening. Following the session on Friday the Commission with members of the legal, engineering and clerical staffs attended the annual banquet and dance of the Los Angeles Chapter of the State Employees Association at which Governor Rolph was the guest of honor.

RISE OF REGISTRATION

The rapid rise of the motor vehicle since the beginning of this century is clearly shown by comparative automobile registration and population figures, according to statistics received by the California State Automobile Association. The population of the United States in 1900 was approximately 89,000,000 and the automobile registration only 8000. At the beginning of 1931 the population was 120,000,000, in round numbers, while the motor vehicle registration had grown to more than \$26,000,000.

Prospective Maid: I'd like to work for you, ma'am, but you've only got a two-car garage. Where'd I put my car?

Mistress: Oh, well, you'd never do at all. We're in the habit of employing only servants who have their private chauffeurs.

Coast Highway Projects Completed or Under Way in Four Counties

By L. H. GIBSON, District Engineer

ON THE COAST HIGHWAY in San Benito County, from the Monterey County line to the San Benito River, 5.5 miles in length, a new road is being constructed via the Pinate Rocks. The roadbed is thirty-six feet wide, with a twenty-foot Portland cement concrete pavement. This project, with a portion of the road in Monterey County 11.1 miles in length just being completed, will eliminate the old San Juan grade from the main Coast Highway.

Within the limits of the above work, a new reinforced concrete bridge across San Juan Creek and a new steel and reinforced concrete bridge across the San Benito River are under construction.

On the lateral highway from three miles north of Hollister to the Pacheco Pass road the road has been resurfaced with bituminous treated crushed stone surface.

Monterey County

A new steel and reinforced concrete bridge across the Salinas River at Bradley has been completed. The approaches to this bridge, 0.5 miles in length, are now under construction. The roadbed is 36 feet wide with a 20' Portland cement concrete pavement.

On the Roosevelt Highway along the coast between Rocky Creek and the San Remo Divide, the old road taken over by the State from Monterey County will be replaced by a new roadway now being constructed. The roadbed is 24 and 30 feet in width, with a selected material surface 20 feet wide by 8 inches thick.

On the Roosevelt Highway south of Carmel three reinforced concrete arch bridges are under construction at Garrapata Creek, at Granite Creek and at Bixby Creek. These bridges are all under the supervision of the Bridge Department.

San Luis Obispo County

On the Coast Highway north of Paso Robles a reinforced concrete bridge across San Marcos Creek has been completed under the supervision of the Bridge Department.

Work has been completed on 9.8 miles of the Coast Highway between Atascadero and

one and one-half miles south of Santa Margarita. The roadbed is 36 feet wide with a 20-foot asphaltic concrete pavement.

On the Coast Highway between Arroyo Grande and Los Berros Creek the road is being reconstructed with a 36-foot roadbed and a 20-foot reinforced Portland cement concrete pavement. New bridges across Arroyo Grande Creek and Los Berros Creek will be advertised soon to complete this project.

Surveys and plans are complete for the reconstruction of the Roosevelt Highway between Cambria and San Simeon.

Santa Barbara County

A major change of line is under construction on the Coast Highway between Los Alamos and one and one-half miles south of Santa Maria on a route through Solomon Canyon. The roadbed is 36 feet in width with a 20-foot reinforced Portland cement concrete pavement. The portion from Los Alamos to two miles north of Solomon Summit, 9.7 miles in length, is under way and bids on the portion from two miles north of Solomon Summit to one and one-half miles south of Santa Maria, six miles in length, were received on November 25, 1931. The road is very close to an air line between Los Alamos and Santa Maria and will be several miles east of the town of Orcutt.

Oiled rock borders on each side of the concrete pavement have been constructed on the Coast Highway between Gaviota Canyon and Teecolote Creek, a distance of 9.6 miles.

Work has been completed on surfacing with crusher run base and oiled rock surface 18 and 20 feet wide, 38 miles of the Cuyama lateral from the second crossing of the Cuyama River to the Kern County line.

Retail spending for automobiles and accessories ranks second only to food in the average family budget, according to reports of the Department of Commerce. Nearly 20 cents out of each dollar spent in retail establishments in 1929 went for automobiles or automotive products, it is revealed. The per capita sales of retail food stores amounted to \$92, while an average per individual during the year for automotive products was \$78.

Then there is the fellow who already thinks he knows the sure substitute for gasoline. He calls it shoe leather.—*Texas Highways*.



BOLD BANDITS of the olden days lurked in these picturesque Pincate Rocks located on a portion of the new road being built in San Benito County to eliminate the tortuous San Juan Grade. Bandit Rock, the conical mass in the foreground provided them a natural vantage point for a lookout. The new road has been carefully aligned to preserve all the scenic and historic values of the locality.

Courtesy An Aid to Safety on Highways

Highway courtesy, such as granting the right of way, signaling for turns and stops, having lights in proper adjustment, and remaining a safe distance behind the car ahead, will go far toward reducing the toll of deaths and injuries, according to a statement by the Public Safety Department of the Automobile Club of Southern California. An analysis of driving faults which contributed to automobile accidents in 1930 is cited in support of the statement.

More than 30 per cent of those involved in accidents last year did not have the right of way. This circumstance alone caused 173,909 accidents and resulted in 4085 fatalities and the injury of 202,795 persons.

Failing to give signals caused more than 7 per cent of the 1930 accidents, while cutting in caused a similar proportion of smashups.

Follow other vehicles only as closely as is reasonable and prudent and will permit you to stop safely if an emergency or other unusual condition is met on the road.

Jerry—I hear you've been studying for months how to increase your salary. How did it turn out?

Freddy—Poorly. The boss was studying at the same time how to cut down expenses.—*Chelsea Record*.

Two Billions Plus Saved by Surfacing

Allowing 15 miles travel on a gallon of gasoline, the 15,000,000,000 gallons consumed in 1930 carried motor vehicles 225,000,000 miles, according to the American Road Builders' statistical department. If half the travel is on the 700,000 miles of surfaced roads and the saving is 2 cents a mile, the saving to the public each year amounts to \$2,500,000,000, a sum in excess of the amount expended on highway maintenance and capital investment in better roads.

She drives a pretty car.
Does pretty reckless Maizy,
And another thing she drives,
Is other drivers crazy.

CALIFORNIA CARS INCREASE

California is one of the eight states out of 36 reported showing an increase in passenger car registration during the first six months of this year as compared with a similar period in 1930. Other states sharing in this indicated return of better business conditions include Connecticut, Florida, Maine, Maryland, Massachusetts, New Jersey, and Rhode Island.

"Doesn't anybody know anything about this car?" asked the stalled motorist in exasperation.
Bystander: "Nothing but some bum jokes."

"Why Not a Minor Improvement?" Says Engineer at a Loss for Funds

By H. A. WATERMAN, Assistant Construction Engineer

IN THE reconstruction budget for each biennium, there is always included an item which has varied from \$1,000,000 to approximately \$1,500,000 for minor project allocations, or what are more commonly known as "Minor Improvements." While most unassuming in title, these funds are of extreme importance to State highway operations and are rapidly increasing in popularity with the district engineers as time goes on.

Because of the nature of the work, the Construction Engineer has always been held responsible for the administration of this money and the results obtained; whereas the work is actually performed, for the most part, by maintenance forces, which are in a sense loaned to the Construction Department for the time being for that purpose.

MINOR IMPROVEMENT DEFINED

When the idea was first put into practice, it was necessary for the Construction Department to do considerable missionary work to see that the projects proposed by the districts came truly within the definition of such work, and that they were not confused with general or specific maintenance. While a certain amount of overlap with the latter is unavoidable, the Construction Department has always adhered strictly to the definition as outlined by the American Association of State Highway Officials, for "Additions and Betterments," which, in effect, is that such work must always add to the capital investment in the highway system and should not be temporary in nature.

Installations of new culverts or lengthening existing ones, widening and day-lighting dangerous mountain roads, placing the higher type of pavement borders, constructing short sections of highway on new alignment, etc., are typical examples of this type of improvement. At the present time, the funds expended on minor improvements are coming in particularly handy to certain of the districts in assisting the unemployment relief being conducted by the Division of Highways through the Maintenance Department. Authorizations for such work, however, are allowed only when it can be classed strictly as minor improvement.

TENTATIVE PROGRAMS REQUIRED

After the approval of the highway budget by the Legislature, the total amount of the minor project allocation shown in the reconstruction budget is apportioned to each district in accordance with its needs, as indicated by work done in previous years. Individual allotments are then authorized as requested and in line with yearly programs submitted in advance to the Construction Department. The districts are not required, however, to adhere exactly to these programs, providing emergencies arise, or more important work must be substituted for that originally planned. Proper explanations for the latter procedure, however, are always required.

The size of the allotments varies from a few hundred to as high as thirty or thirty-five thousand dollars, but, in general, the larger projects are not looked upon with favor, and, if such allotments are made, the work is let to contract, if possible, rather than performed by day labor forces, as heretofore explained.

Projects costing in the neighborhood of \$5,000 are more in agreement with the Minor Improvement policy, and the average of the projects throughout all the districts is generally not far from that figure. During the eighty-first-eighty-second biennium, for example, a total expenditure of \$1,006,660 was authorized, distributed among 254 work orders; the average being \$3,963 per project.

POPULAR WITH ALL

When one considers the flexibility of these funds, and the fact that there is nowhere else in the budget to which a district engineer can turn for small unbudgeted construction expenditures, arising either as emergencies or simply because they have been inadvertently overlooked, it is no wonder that minor improvements are popular. And small as the projects are in comparison with the usual run of highway contracts, there is no part of the biennium set-up so well adapted to correcting small and oftentimes irritating defects in the highway as the Minor Improvement fund.

Strangely enough, these small projects seem to make a great impression on the average motorist.



SURE TO PLEASE motorists, is this minor improvement on the State highway near Deadman's Springs, Amador County, where a sharp open curve was flattened out for safer driving.



"BLIND BUT DANGEROUS" would have been a fitting warning sign for this curve on the State highway east of Jackson, Amador County, before a rectifying operation classed as a minor improvement corrected it.



A FLOOD VICTIM, this culvert in Orange County, though widened and deepened, was almost washed out.



NOW IT STANDS UP, having been rebuilt as a minor improvement without interrupting traffic.

Many Notable By-Pass Routes Cited

(Continued from page 14)

The streets and roads in the area where business establishments have congregated are there primarily for the service of the customers of these establishments—local traffic. This traffic, by the manner in which it moves and operates, causes more or less congestion depending on the capacity of the street and the bargains offered. Why then force through traffic—one requiring entirely different accommodations—on to the streets designed and devoted to the purpose of serving business? It only interferes with and hinders local traffic, must consequently detract from the volume of business transacted and occasions delay and aggravation to through traffic.

Widening the artery is only temporary relief—a palliative, not a cure. Widening introduces additional complications involving pedestrians and cross traffic. Separation of the two types of traffic is indicated as the proper ultimate solution. It will result eventually, if not by planning, then by a gradual change in the character of business.

As through traffic increases and finds no other provision for its accommodation, it discourages local traffic and finally forces it and the business supported by it from the thoroughfare.

Planning and designing a separation of these classes of traffic is certainly much more desirable than creating economic loss. The first, local traffic, is already provided for. The logical plan then is to make additional provision for the second, through traffic. Its requirements are freedom from congestion and interference, directness, speed.

BY-PASS LOGICAL

The by-pass route is the logical solution. The by-pass does not necessarily mean the by-passing of the entire community. It means a route which will avoid the congested areas, direct and free from interference. There should be afforded ample opportunity to enter or depart to or from the business and commercial area for vehicles desiring to do so.

The by-pass road should probably diverge from the main thoroughfare entering the congested area at a point which will avoid the bulk of the local traffic.

Various types of by-pass routes have been constructed and are in use today. A notable

example is the main highway from St. Louis to Kansas City. Practically every town along the route is by-passed for through traffic and, at the same time, easy access is provided for traffic to reach these communities. In our own State we have numerous examples. The Newhall-Saugus by-pass route, avoiding the smaller towns of Newhall and Saugus, saves a distance of at least four miles for the through traveler. A by-pass of the town of Carlsbad, on the Coast Highway between Los Angeles and San Diego, takes through traffic out of the congested area and, at the same time, effects a marked improvement in alignment. By-pass of the business district in Dixon not only avoids the congested main street but also eliminates two hazardous railroad crossings of a main line railroad.

Mr. E. E. East, Chief Engineer of the Automobile Club of Southern California, suggests the following as a basis for studies having to do with by-passing a city or town:

BASIS FOR STUDIES

"For a town of appreciable size, our studies have developed the following facts, which in most instances may be taken as the basis for studies having to do with by-passing any particular city or town.

First, by far the greater number of all vehicles entering or leaving any given town or city are local.

Second, these local vehicles are entering the town or city for the purpose of transacting business, or as their destination.

Third, this local travel entering and leaving the city, together with vehicles operating within the city boundaries, represents the automobile purchasing travel, and as such should be afforded a maximum of convenience.

Fourth, the remainder of the motorists have a destination in view, and forcing them down 'Main Street' inconveniences purchasing travel, to the ultimate loss of business on the street."

The Automobile Club of Southern California has analyzed traffic movements in Los Angeles County. Dividing the county into five concentric areas, observing and analyzing movements of motor vehicles over the several boundaries, they found:

"The movement during the year 1930, expressed in number of vehicles daily, is in round numbers as follows: in and out of the county, 75,900; in and out of the metropolitan area, 305,900; in and out of the residential area, 705,700; in and out of the outer congested area, 618,700; in and out of the central business area, 531,500. Cars entering the county represent about 11 per cent of those entering the residential area."

Action Needed to Secure Coast Routes

(Continued from preceding page)

PRESENTS PROBLEM

Here is presented a problem for consideration of the county or regional planning commission. The large volume of traffic encountered at the outskirts of the city in what is still urban area must be collected or dispersed. It must be brought to or carried away from the main highway, the State highway, leading to other centers of population. Provision must be made to send it expeditiously to the destinations which it desires to reach.

If our main thoroughfares, designed for the expeditious movement of traffic over long distances, are to continue to function in that capacity, the improvements and establishment of enterprises along the highway should be so controlled that the minimum interference will result. Establishing setback lines may be one remedy, at least a preventive.

A plan of highway improvement, such as is being considered for a section of State highway in Santa Barbara County through Montecito, offers an excellent solution. Essentially, it is planned to carry through traffic on the central portion of the right of way and to provide for local traffic on side roads separated from the through traffic lanes by planted parking strips.

ZONING POSSIBLE

Zoning restrictions may be the means which will prevent the conversion of the highway into a congested business street at least so long as it does not hinder the natural growth and development of the territory. When the natural development envelopes a section of highway to such an extent that it must be given over to business, a by-pass road for through traffic should be ready for relief of congestion.

To preserve the aesthetic values, regulations of the character of improvement are needed. Hot dog shacks, dilapidated, fantastic structures housing every kind of enterprise certainly do not soothe the eye, although their products may temporarily cheer the stomach. The State and federal government are cooperating for the preservation of scenic, aesthetic and recreational values through the national forests.

A policy recently promulgated by the national Forest Service contemplates ac-

complishment of this object by reserving a 400-foot wide strip of land along the highway on which no encroachments will be permitted. Special use permits, issued for locations along the highway, will provide restrictions and regulations concerning the type of improvement to be installed.

COAST VALUES LEAPING

Reference to scenic and recreational values suggests another matter of interest: California has a thousand miles of coast line wonderfully beautiful and picturesque. If properly preserved and developed, it will be of great value to the people of this State.

Along one of the State highways, sections of this coast have reached the astounding value of \$1,000 and more per foot of ocean front, or \$5,000,000 per mile. Speculators, inspired by these values, are buying up attractive sections of coast ahead of highway construction. Establishment of such values forces acceptance of location and alignment decidedly inferior to what might be obtained if timely action is taken. There is still opportunity along many miles of coast to obtain a location for highways returning maximum value to the public, but such action must not be too long delayed.

In the planning and designing for these various needs, one of the most important factors is a thorough and definite knowledge of traffic movement. It is not sufficient that we know only the amount, but we should also determine the origin, destination and character. Such data are most vital in determining the location, standard, character or type of the highway.

RESPONSIBILITY REALIZED

The problems above briefly outlined have come to our attention as those in which the State, the cities and counties have a common interest. Their solution requires cooperative action. Existing legislation makes it possible for local authority to amplify State efforts and to protect the rights of the public.

The State Division of Highways realizes that its responsibility does not cease when it has built the State highway to the city's door. But it also realizes that the local planning commission is in closer touch with the needs of its community.

At the Second Pillar of Architecture

By **FREDERICK M. GREEN**, Assistant Structural Engineer

THE THREE great pillars that support architecture may be named Wisdom, Strength and Beauty.

The architect by wisdom contrives the plan of the building to the end that it may serve the purpose for which it is intended. In

modern parlance this element of the design is called Utility.

Strength has reference to the stability of the structure; the capacity of the foundation soil to sustain the weight of the building, the capacity of each column, beam and girder safely to carry the loads imposed upon it, the ability of the materials entering into the structure to resist wear after year the stresses induced by the loads imposed.



Frederick M. Green

BEAUTY AND STRENGTH

Beauty—well we all know what beauty is—but who shall succeed in expressing in mere words that intangible elegance and harmony that we call beauty.

It is the duty of the structural engineer to attend at the second pillar, that called Strength. The architect must be left free to solve the problems of utility and, as an artist, to capture and imprison in the dense matter of the building as much of beauty as circumstances permit. It is the function of the structural engineer to design a structure that will embody in the form conceived by the artist, the strength needed to sustain that form.

ALWAYS A PROBLEM

At a wedding the bride is supposed to wear "something old and something new, something borrowed and something blue." Some architectural designs are a bit like that. Often they contain something old, something new, and something borrowed—and sometimes something blue, but in the kaleidoscopic com-

The Thinker

Back of the beating hammer
By which the steel is wrought,
Back of the workshops' clamor
The seeker may find the thought.
The thought that is ever master
Of iron and steam and steel,
That rises above disaster
And tramples it under its heel!

The drudge may fret and tinker,
Or labor with lusty blows,
But back of him stands the thinker,
The clear-eyed man who knows:
For into each plow or saber,
Each piece and part and whole,
Must go the brains of Labor
Which gives the work a soul!

Back of the motor's humming,
Back of the belts that sing,
Back of the hammer's drumming,
Back of the cranes that swing,
There is an eye which scans them,
Watching through stress and strain,
There is a mind which plans them—
Back of the brawn, the brain!

Might of the roaring boiler,
Force of the engine's thrust,
Strength of the sweating toiler,
Greatly in these we trust,
But back of them stands the schemer,
The thinker who drives things through;
Back of the job—the dreamer,
Who's making the dream come true!

—By **BERTON BRALEY**
—in *California Engineer*

bination of these old and new, there results always a new problem for the structural engineer.

As no two artists ever dreamed the same dream, so no two building designs are ever exactly alike. The variety is infinite. There is always something new to which the basic principle of structural engineering must be applied, always a new search for the answer to the problem "How to make the artist's dream come true" to the end that neither weight nor load, wind nor shock, heat nor cold, or any other thing shall prevail against the strength of the building but rather that it shall stand for all the years of its usefulness—a safe and serviceable creation.

Major Projects Reaching Completion

(Continued from page 12)

opened December 23. With the paving of this section, the project will present a modern pavement from Sacramento to the State line near Reno.

The Governor's relief employment program, financed by an allocation of \$1,500,000 for extra maintenance work, is well under way. With variations in totals due to personal or local conditions, between 3200 and 3600 men have been given employment and the quotas are now in the process of being brought to their maximum of 4000.

ARCHITECTURE DIVISION

The year's story of the Division of Architecture is one of activity. A condensed statement shows:

By December 30, the Division of Architecture will have had under actual construction since January 1, 1931, a total construction of \$8,225,617, representing 177 projects.

At this time, December 16, 115 of these projects have been completed at a construction value of \$4,420,098.

During the current month, the Division of Architecture will have placed on the bidding market, building projects of a construction value in the total of \$1,194,000. These will include the new hospital building for the Veterans' Home.

In January, bids will be called on projects having an additional construction value of \$681,000.

WATER DIVISION ACTIVITIES

As a result of a ten years investigation of the water resources of California, the State Engineer filed a summary report on the State Water Plan with the 49th Session of the California Legislature, accompanied by texts of supplementary reports containing the detail and bearing on water resources conditions in various sections of California.

One of Governor Rolph's first declarations was that the water problem is paramount.

In furtherance of the State water conservation plan, and following up the results of ten years investigation of resources, the Governor appointed a water conservation committee of seven members to proceed at once to Washington and confer with the federal authorities with the view of securing their cooperation with the State government. The committee proceeded to Washington in Febru-

ary. The result of their efforts was reflected in the tour made through California by the congressional committee on appropriations for the Department of the Interior. The congressmen were attended by several federal officials and members of the legislative committee, and during July, traversed the State from south to north.

COMMISSION APPOINTED

Two months later a corps of U. S. engineers for rivers and harbors made a close inspection of the situation. Anticipating the need of enabling legislation for the State plan, the Governor appointed the California Water Resources Commission, with six ex-official members from among State officials. Likewise, the Governor appointed sixteen honorary advisory committees representing practically all interests and localities.

In addition to these bodies, a joint legislative committee of fourteen members has been in collaboration with the commission appointed by the Governor. The meetings have been harmonious, and it is believed that constructive progress has been made.

The Water Resources Division is not a State disbursing agency. The work of its staff is advisory and supervisory. However, they pass on a vast amount of work financed by corporate and private investors.

During 1931, dams proposed carried an estimated cost of \$19,000,000. Since August 1929, the staff has passed on about \$34,000,000 of this class of improvements. During the same period, 787 dam applications have been offered for approval, and 214 applications for repairs or alterations. Of these, 181 have been approved. For the year, 61 applications have been approved, 50 being for new dams and 11 for enlargements.

OUTLOOK BRIGHTER

In connection with the supervision of irrigation districts by the State Engineer, the year has brought authorization by the California Districts Securities Commission for the funding of \$15,931,250 of bonds. A critical situation in the districts was met and the outlook is much brighter than for years. In addition, bonds of the par value of \$629,000 were validated and expenditures in the sum of \$987,100 approved, and certification given to \$650,000 of current issues.

Highway Bids and Awards for November

HUMBOLDT COUNTY—Reconstructing bridge across Bel River at Robinson's Ferry, consisting of twenty-two 24' timber spans, three 250' steel truss spans and twenty-three 19' timber spans. Dist. I, Rt. 1, Sec. E, Fred J. Maurer & Son, Inc., Eureka, \$29,360; Smith Bros. Company, Eureka, \$24,966; W. J. O'Neil, San Francisco, \$29,985; C. W. Wood, Stockton, \$27,040; Pacific Bridge Co., Portland, Oregon, \$29,225. Contract awarded to Mercer-Fraser Co., Eureka, \$20,752.

MONO COUNTY—From Casa Diablo Hot Springs to Crestview, 5.8 miles grading and surfacing bituminous treated gravel. Dist. IX, Rt. 23, Sec. EF. Daniel Bayles, Biggs, \$164,872; Southern Calif. Roads Co., Los Angeles, \$154,117; Hemstreet and Bell, Marysville, \$177,205; Jack Casson, Hayward, \$215,045; W. H. Hauser, Oakland, \$176,496; Larsen Bros., \$163,961; A. Teichner & Son, Sacramento, \$159,714; Skeels & Graham, Roseville, \$161,854; Fred W. Nighbert, Bakersfield, \$195,375; Gist & Bell, Arcadia, \$183,755; C. C. Willis & Sons, Los Angeles, \$206,402; Mecca Const. Co., Clearwater, \$189,985; Isbell Const. Co., Carson City, Nev., \$193,168. Contract awarded to Morrison-Knudsen, Boise, Idaho, \$142,169.

RIVERSIDE COUNTY—At the Shaver's Summit Maintenance site, water supply well to be drilled and furnished complete. Dist. VIII, Rt. 64, Sec. E, A. A. Barnett, Temecula, \$7,600; Roscoe Bloss Co., Los Angeles, \$4,030. Contract awarded to Lyon Bros., Los Angeles, \$3,000.

SAN BENITO COUNTY—Two bridges 8 miles south of Gilroy, a reinforced concrete girder bridge across San Juan Creek consisting of one 34' and two 23' spans; the other across San Benito River, consisting of three 100' steel and ten 40' reinforced concrete spans. Dist. V, Rt. 2, Sec. B, Force Construction Co., Piedmont, \$102,120; Gist & Bell, Arcadia, \$92,090; M. E. McGowan, San Francisco, \$94,995; Gutleben Bros., Oakland, \$90,095; Bodenhamer Construction Co., Oakland, \$92,825; Smith Bros. Company, Eureka, \$102,766; Healy-Tibbitts Construction Co., San Francisco, \$91,015; A. W. Kitchen, San Francisco, \$92,471; A. J. Raisch, San Jose, \$90,639; Neves & Harp, Santa Clara, \$103,783; C. W. Wood, Stockton, \$104,028; Lord and Fishon, Sacramento, \$99,868; Oberg Bros., Los Angeles, \$109,481. Contract awarded to George J. Ulrich Construction Co., Modesto, \$87,966.

SAN BERNARDINO COUNTY—At the Baker Maintenance site, water supply well to be drilled and furnished complete. Dist. VIII, Rt. 31, Sec. K. Contract awarded to J. W. Burkhardt, Victorville, \$747.

SAN BERNARDINO COUNTY—Devore to Alray, about 10.9 miles to be graded and surfaced with selected oil-treated material. Dist. VIII, Rt. 31, Sec. B, Hemstreet & Bell, Marysville, \$448,986; von der Hellen & Pierson, Castaic, \$367,923; Gist & Bell, Arcadia, \$424,686; Lang Transportation Co., Los Angeles, \$333,418; Granfield, Sarrar & Carlin, San Francisco, \$397,882; Gibbons & Reed Co., Burbank, \$379,413; Macco Construction Co., Clearwater, \$358,146; Griffith Co., Los Angeles, \$341,964; H. W. Rohl Co., Los Angeles, \$349,251; Lewis Construction Co., Los Angeles, \$330,838; Jahn & Bressi Construction Co., Inc., Los Angeles, \$353,697; Southern California Roads Co., Los Angeles, \$341,750; Morrison-Knudsen Co., Boise, Idaho, \$361,471; George Pollock Co., Sacramento, \$342,640. Contract awarded to Healy-Tibbitts Construction Co., San Francisco, \$321,514.

SAN DIEGO COUNTY—Between Del Mar and Solano Beach, about 0.6 mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 2, Sec. A, Basich Bros. Construction Co., Torrance, \$42,660; E. Paul Ford, East San Diego, \$39,940; Steele Finley, Santa Ana, \$41,349; Iglesias Bros., Inc., San Diego, \$37,921; C. E. Butterfield, San Pedro, \$44,512; Oberg Bros., Los Angeles, \$43,945. Contract awarded to B. G. Carroll, San Diego, \$37,480.

SAN DIEGO COUNTY—About 0.25 mile of roadbed to be widened and heavy fuel oil to be applied through Encinitas between "D" and "A" Streets. Dist. VII, Rt. 2, Secs. A & B, H. E. Cox & Son, Pasadena, \$3,564. Contract awarded to Cozens & Hammond, Encinitas, \$2,607.

SANTA BARBARA COUNTY—Between Los Alamos and 2 miles north of Solomon Summit, 9.7 miles to be graded and paved with Portland cement concrete.

Dist. V, Rt. 2, Secs. C, M & L, Matich Bros., Elsinore, \$337,349; Thomas C. Rogers, Los Angeles, \$376,585; Sander Pearson, Santa Monica, \$371,726; McCray Co., Los Angeles, \$341,649; Griffith Co., Los Angeles, \$344,427; Morrison-Knudsen Co., Boise, Idaho, \$345,460; Hanrahan Co., San Francisco, \$332,111; Peninsula Paving Co., San Francisco, \$316,343; C. W. Wood, Stockton, \$312,375; Macco Construction Co., Clearwater, \$325,409; N. M. Ball, Porterville, \$338,229; Basich Bros., Torrance, \$307,216; Granite Construction Co., Ltd., Watsonville, \$320,998; Jahn & Bressi Construction Co., Inc., Los Angeles, \$313,477; Southern California Roads Co., Los Angeles, \$327,947; Kovacevich and Price, Inc., Southgate, \$343,956; Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$335,289; Healy-Tibbitts Construction Co., San Francisco, \$332,030. Contract awarded to M. J. Bevanda, Stockton, \$306,711.

SHASTA COUNTY—Reinforced concrete girder bridge at Clear Creek, about 18 miles west of Redding, consisting of four 52' spans on concrete piers and bents. Dist. II, Rt. 20, Sec. A, M. B. McGowan, San Francisco, \$22,448; R. B. McKenzie, Red Bluff, \$24,493; John Berlinger, Orland, \$22,685; Smith Bros. Co., Eureka, \$27,632; Fred J. Maurer & Son, Inc., Eureka, \$24,990; Rolla Arubuckle, Anderson, \$21,136; Skeels & Graham Co., Roseville, \$24,682; Holdener Construction Co., Sacramento, \$27,753; Peter McHugh, San Francisco, \$26,734; Whited & Whited, Santa Rosa, \$22,472. Contract awarded to J. P. Brennan, Redding, \$20,822.

SISKIYOU COUNTY—Bridge across Beaver Creek 15.5 miles west of Junction Rt. 3, consisting of three 50' steel beam spans on concrete bents. Dist. II, Rt. 46, Sec. D, J. P. Brennan, Redding, \$31,242; F. J. Maurer & Son, Inc., Eureka, \$33,347; Gist & Bell, Arcadia, \$34,230; J. Berlinger, Orland, \$27,430; Albert Young, Yreka, \$39,500; R. B. McKenzie, Red Bluff, \$34,910. Contract awarded to J. W. Hoopes, Sacramento, \$31,035.

SISKIYOU COUNTY—Bridge across Klamath River at Walker, consisting of one 320' steel truss span on concrete piers and six 19' timber approach spans. Dist. II, Rt. 46, Sec. D, Smith Bros. Co., Eureka, \$29,119; John Berlinger, Orland, \$27,518; M. B. McGowan, San Francisco, \$27,555; C. W. Wood, Stockton, \$30,000; J. P. Brennan, Redding, \$27,167. Contract awarded to Gutleben Bros., Oakland, \$20,728.

TRINITY COUNTY—Between Weaverville and Grass Valley Creek, crushed gravel or stone in stock piles. Dist. II, Rt. 20, Secs. A-B, James W. Bertram, Weott, \$12,112; E. B. Bishop, Sacramento, \$12,612. Contract awarded to S. R. Eastwood & S. Eastwood, Redding, \$12,015.

VENTURA COUNTY—Reinforced concrete girder bridge across Arroyo Calleguas 1 mile east of Camarillo, consisting of one 60' span and two 30' spans. Dist. VII, Rt. 2, Sec. B, Nead Construction Co., Wilmington, \$28,426; Gist & Bell, Arcadia, \$28,639; R. R. Bishop, Long Beach, \$28,848. Contract awarded to Merritt-Chapman & Scott Corporation, San Pedro, \$25,755.

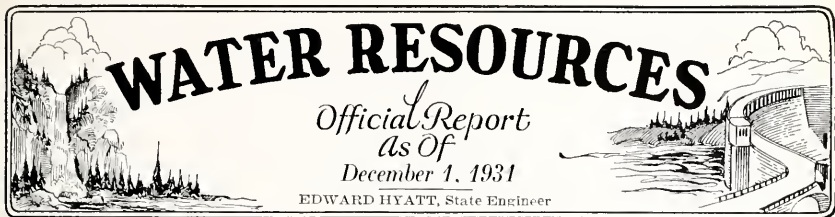
Why some motor vehicle drivers continually have accidents while other drivers rarely, if ever, have any is one of the puzzling problems for consideration by the annual Safety Congress in Chicago. The material for this subject came from a recent study of a group of commercial fleet operators. This revealed that about one-third of the drivers checked had no accidents whatever; another one-third averaged two accidents each; while the remainder of the group ranged from three to ten accidents each.

"Which do you like better, balloon tires or high pressure tires?"

"Why, I like balloon tires better."

"But they claim that balloon tires reduce the power of the car."

"Well, I don't care if it does—I am a pedestrian," —*Texas Highways.*



Favorable action on the State water plan by the California Irrigation Districts Association, approval of the sale of irrigation district bonds and new contracts, by the District Securities Commission, and a series of joint meetings in Southern California by Governor Rolph's California Water Resources Commission and the Joint Legislative Water Committee are features of the monthly report of the Division of Water Resources under State Engineer Edward Hyatt. The report includes details of flood control, reclamation and maintenance work and news of the increased flow of the Sacramento and San Joaquin rivers as follows:

The California Irrigation Districts Association held its biennial meeting at Marysville on November 13 and 14. Most of the time of the session was given to the discussion of the State Water Plan and to an explanation of procedure under the irrigation District Act as amended by the 1911 Legislature.

The State Water Plan was briefly explained by State Engineer Hyatt and discussed at some length by Senators Crittenden, Rich and others. The Association unanimously adopted a resolution favoring the "ultimate conservation of the water resources of the State through cooperation of the Federal government and the State of California with local agencies to carry out progressively a comprehensive plan, said plan to be fair, just and economically sound, and to preserve to each area having surplus water a sufficient supply for its future development and not to interfere with existing water rights." The association also pledged its cooperation to Governor Rolph and his water commission and to the Joint Legislative Committee in working out the plan.

REQUESTS APPROVAL

At a meeting of the Districts Securities Commission on October 27, favorable action was taken on requests for approval as follows:

Cordua Irrigation District—Sale or exchange of \$64,000 principal amount of district refunding bonds at \$0.90.

Nevada Irrigation District—Private sale of \$50,000 principal amount of district bonds at \$0.90.

Turlock Irrigation District—New contracts with the San Joaquin Light and Power Company and the Pacific Gas and Electric Company from the sale and purchase of power.

Lindsay-Strathmore Irrigation District—Contracts for the purchase of 230 shares of stock of the Peoples Ditch Company.

Visits for the purpose of considering matters in their interests were made to the following districts:

Waterford irrigation district, Stanislaus County; West Side and Linden irrigation districts, San Joaquin County; Carpenter and Serrano irrigation districts, Orange County; Vista, Santa Fe and San Dieguito irrigation districts, San Diego County.

DAMS

To date 780 applications have been received for approval of dams built prior to August 14, 1929; 87 applications for approval of plans for construction or enlargement; and 203 applications for repairs.

Applications Received for Approval of Plans for Enlargement of Dams

Dam	Owner	County
McGowan	First National Bank	Tehama

Applications Received for Approval of Plans for Repairs or Alterations

Dam	Owner	County
Greenleaf	City of Whittier	Los Angeles
Lawler	Calif. Water Service Co.	Sonoma
Shelton	A. A. Curtis	Modoc
Lower St. Helena	Town of St. Helena	Napa
Jameson Lake	Carnation Gold Mining Co.	Plumas
El Casco	G. O. Trautzel	Riverside
San Pablo	East Bay Municipal Utility District	Contra Costa

Plans for the construction of the Bouquet Canyon Dam, to be built by the city of Los Angeles, were approved on October 29, 1931. This will be a large earthfill structure 170 feet high with a storage capacity of 36,200 acre feet.

Sixteen applications for approval of plans for repairs or alterations were approved during this period. Repairs necessary to place dams in shape for the winter season have been completed.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project.

Routine maintenance work has been carried on, including the conditioning of the drainage pumping plants and painting the buildings at these plants.

Maintenance clearing operations in the Sutter and Tisdale by-passes have been continued with two crews of twenty men each. As an unemployment relief measure, these crews are operating on a five-day week basis and each man is permitted a total of ten days actual work at \$4 per day.

A gang of nine men is engaged in leveling a portion of the area recently cleared and stumped in the Sacramento By-pass, so that it can be plowed and cultivated as a means of permanently doing away with maintenance costs.

The Reclamation Board has granted a lease to the Division for 3.18 acres one mile from Sutter City, on

(Continued on page 40)

November Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of November, 1931.

TULARE COUNTY—Application 7110. U. S. Sequoia National Forest, c/o Frank P. Cunningham, supervisor, Porterville, for 1200 gallons per day from unnamed spring tributary to South Fork of Middle Fork Tule River to be diverted in section 34, T. 20 S., R. 31 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

MODOC COUNTY—Application 7111. E. G. Scammon, Herman Schadler, Curtis Mathews, W. J. Wadhams, C. A. Moister and H. E. Bennett, c/o E. G. Scammon, mgr. Land Dept. Red River Lumber Co., Westwood, for 25 c.f.s. from Cowhead Creek tributary to Cowhead Lake to be diverted in section 16, T. 47 N., R. 17 E., M. D. B. and M., for irrigation purposes. (2600 acres.)

NEVADA COUNTY—Application 7112. Edward Bickel, P. O. Box 881, Nevada City, for 2000 gallons per day from unnamed spring tributary to Osborn Creek, thence Little Greenhorn Creek, Greenhorn Creek and Bear River to be diverted in section 5, T. 16 N., R. 10 E., M. D. B. and M., for mining and domestic purposes.

NEVADA COUNTY—Application 7113. Edward Bickel, P. O. Box 881, Nevada City, for 15 c.f.s. from Little Greenhorn Creek tributary to Greenhorn Creek, thence Bear River to be diverted in section 4, T. 16 N., R. 10 E., M. D. B. and M., for mining and domestic purposes.

BUTTE COUNTY—Application 7114. Richvale Irrigation District, Richvale, for 15 c.f.s. from Dry Creek tributary to Butte Creek to be diverted in section 6, T. 19 N., R. 2 E., M. D. B. and M., for irrigation purposes. (500 acres.) Estimated cost \$2,000.

INYO COUNTY—Application 7115. Standard Oil Company of California, a corporation, c/o W. F. Vane, 225 Bush St., San Francisco, for 40,000 gallons per day from Last Chance Springs (3 springs) tributary to Death Valley Watershed to be diverted in section 2, T. 8 S., R. 39 E., M. D. B. and E., for mining and domestic purposes. Estimated cost \$500.

HUMBOLDT COUNTY—Application 7116. Arthur McBride, Winford Otley, Ralph Peters and Geo. W. Smith, c/o Allen and McNamara, attys., Yreka, for 10 c.f.s. from Five Mile Creek tributary to Klamath River to be diverted in section 16, T. 11 N., R. 6 E., H. B. and M., for power purposes. (681 h.p.) Estimated cost \$1200.

CALAVERAS COUNTY—Application 7117. Claude Rogers, P. O. Box 43, Station A, Berkeley, for 7.8 c.f.s. from Mokelumne River tributary to San Joaquin River to be diverted in section 1, T. 4 N., R. 9 E., M. D. B. and M., for mining and domestic purposes.

TRINITY COUNTY—Application 7118. Calvin H. Baskind, 417 Mutual Life Building, Seattle, Washington, for (1) 30, (2) 4, (3) 6, (4) 6, (5) 4, total 50 c.f.s. from (1) Mosquito Creek, (2) Big Lake, (3) Ammon Creek, (4) White Sides, (5) Bear Trap Creek tributary to South Trinity River to be diverted in sections 33, 26, 27, 11 and 14, T. 5 N., R. 5 E., M. D. B. and M., for mining and domestic purposes.

KERN COUNTY—Application 7119. Harold B. Herschman, c/o Leonard E. Weisenburg, 4816 Cramer Ave., North Hollywood, for 5 c.f.s. from Red Rock Canyon tributary to Mojave Desert Drainage Area to be diverted in section 2, T. 30 S., R. 37 E., M. D. B. and M., for mining and domestic purposes.

SIERRA COUNTY—Application 7120. Walter Hayter, Comptonville, for 3.0 c.f.s. from Big Humburg Creek tributary to N. Fork Yuba River to be diverted in section 15, T. 19 N., R. 9 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$1,500.

TUOLUMNE COUNTY—Application 7121. Milo H. Neidig, c/o R. C. Baermeister, Sonora Inn, Sonora, for 3 c.f.s. from South Fork of Stanislaus River tributary to Stanislaus River to be diverted in section 24, T. 3 N., R. 15 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$2,500.

MONO COUNTY—Application 7122. Governor F. B. Balzar, Carson City, Nevada, for 200 gallons per day

from small unnamed stream tributary to Lower Twin Lake to be diverted in section 5, T. 3 N., R. 24 E., M. D. B. and M., for domestic purposes.

SISKIYOU COUNTY—Application 7123. William M. Clark, Happy Camp, for 1.0 c.f.s. from Tanners Gulch tributary to S. Fork Indian Creek, thence Indian Creek and Klamath River to be diverted in section 13, T. 17 N., R. 6 E., M. D. B. and M., for mining purposes. Estimated cost \$100.

SAN JOAQUIN COUNTY—Application 7124. Hunt Bros. Packing Company, c/o Chickering and Gregory, attys., Merchants Exchange Building, San Francisco, for 3.9 c.f.s. from Mormon Slough tributary to San Joaquin River to be diverted in section 7, T. 2 N., R. 9 E., M. D. B. and M., for irrigation purposes. (313.5 acres.) Estimated cost \$5,000.

EL DORADO COUNTY—Application 7125. B. W. Stone, 161 Ellis St., San Francisco, for 5000 c.f.s. and 125,000 ac. ft. per annum from (1) Rubicon River, (2) Pilot Creek, (3) Gerle Creek, (4) Loon Lake, (5) Buck Island Lake, (6) Rock Bound Lake, (7) Little S. Fork Rubicon River tributary to American River Drainage to be diverted in section 9, T. 13 N., R. 16 E., section 11, T. 12 N., R. 12 E., section 24, T. 13 N., R. 13 E., sections 11, 31 and 34, T. 14 N., R. 14 E., section 4, T. 13 N., R. 15 E., section 2, T. 13 N., R. 14 E., M. D. B. and M. for municipal purposes.

SAN DIEGO COUNTY—Application 7126. John Allen and Almira E. Crawford, Box 54, Potrero, for 26 ac. ft. per annum from Camp Creek tributary to Tecate River to be diverted in section 24, T. 18 S., R. 4 E., S. B. B. and M. for recreational and domestic purposes. Estimated cost \$1,000.

SAN BERNARDINO COUNTY—Application 7127. H. C. Zech, 116 E. 31st St., Los Angeles, for 0.0625 c.f.s. from unnamed spring tributary to Bear Valley or Baldwin Lake to be diverted in section 31, T. 2 N., R. 2 E., H. B. and M., for domestic purposes. Estimated cost \$2,500.

BUTTE COUNTY—Application 7128. O. J. Laing, Paradise, for 3.0 c.f.s. from Springs tributary to Coon Hollow Creek, thence W. Branch N. Fork Feather River, N. Fork Feather River, Feather River and Sacramento River to be diverted in section 9, T. 25 N., R. 5 E., M. D. B. and M., for mining purposes. Estimated cost \$10,000.

SIERRA COUNTY—Application 7129. H. L. Berkey, c/o Jas. P. Sweeney, 68 Post Street, San Francisco, for 60 c.f.s. from Canyon Creek tributary to Yuba River to be diverted in section 18, T. 21 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$60,000.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources during the month of November, 1931.

TEHAMA COUNTY—Permit 3812, Application 7078. Thomas J. Pellew, 409 45th St., Oakland, November 7, 1931, for 0.037 c.f.s. from unnamed stream, tributary to Elder Creek, thence Sacramento River in section 34, T. 25 N., R. 7 W., M. D. B. and M., for irrigation of 1 acre. Estimated cost \$300.

INYO COUNTY—Permit 3813, Application 6896. Leo Kikut, Olancha, November 12, 1931, for 0.12 c.f.s. from unnamed spring, tributary to Owens Lake in section 26, T. 18 S., R. 36 E., M. D. B. and M., for irrigation of 10 acres. Estimated cost \$400.

RIVERSIDE COUNTY—Permit 3814, Application 6922. R. A. Merchant, 224 Oak St., Monrovia, November 19, 1931, for 0.12 c.f.s. from seepage water tributary to Santa Ana River in section 9, T. 3 S., R. 5 W., S. B. B. and M., for irrigation of 10 acres.

STANISLAUS COUNTY—Permit 3815, Application 7071. Joe V. Cordoza, Rt. 2, Box 1254, Modesto, November 19, 1931, for 1.00 c.f.s. from Stanislaus River, tributary to San Joaquin River in section 20, T. 2 S., R. 8 E., M. D. B. and M., for irrigation of 80 acres. Estimated cost \$1,500.

TRINITY COUNTY—Permit 3816, Application 6953. L. E. Wheeler and W. M. McChumber, Denny, November 21, 1931, for 1.00 c.f.s. from S. Fork of East Fork of New River, tributary to Trinity River in section 8, T. 36 N., R. 12 W., M. D. B. and M., for mining. Estimated cost \$700.

(Continued on page 43)

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of November, 1931.

LASSEN COUNTY—Emerson Dam No. 255. Tro Emerson, Susanville, owner; earth, 17 feet above streambed with a storage capacity of 260 acre feet, tributary to Susan River in section 16, T. 29 N., R. 12 E., M. D. B. and M., for storage purposes, for irrigation use.

ORANGE COUNTY—Basin "A" Dam No. 795. Union Oil Company, Los Angeles, owner; earth, 14 feet above streambed, located in section 10, T. 3 S., R. 10 W., S. B. B. and M.

ORANGE COUNTY—Basin "B" Dam No. 795-2. Union Oil Company, Los Angeles, owner; earth, 13 feet above streambed, located in section 10, T. 3 S., R. 10 W., S. B. B. and M.

ORANGE COUNTY—Basin "C" Dam No. 795-3. Union Oil Company, Los Angeles, owner; earth, 12 feet above streambed, located in section 10, T. 3 S., R. 10 W., S. B. B. and M.

ORANGE COUNTY—Basin "D" Dam No. 795-4. Union Oil Company, Los Angeles, owner; earth, 13 feet above streambed, located in section 11, T. 3 S., R. 10 W., S. B. B. and M.

TEHAMA COUNTY—McGowan Dam No. 262. First National Bank, Santa Ana, owner; earth, 10.5 feet above streambed with a storage capacity of 20 acre feet, situated on Battle Creek, tributary to Sacramento River in section 9, T. 29 N., R. 4 E., M. D. B. and M., for storage purposes, for recreation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of November, 1931.

TEHAMA COUNTY—McGowan Dam No. 262. First National Bank, Santa Ana, owner; 12.5 feet above streambed with a storage capacity of 35 acre feet, situated on Battle Creek, tributary to Sacramento River in section 9, T. 29 N., R. 4 E., M. D. B. and M., for storage purposes, for recreation use. Estimated cost \$500, fees paid \$20.

SAN DIEGO COUNTY—El Capitan Dam No. 8-7. City of San Diego, San Diego, owner; earth and rock, 197 feet above streambed with a storage capacity of 118,000 acre feet, situated on San Diego River in section 7, T. 15 S., R. 2 E., S. B. B. and M., for storage purposes for municipal use. Estimated cost \$3,226,595.25, fees paid \$7,726.60.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of November, 1931.

NAPA COUNTY—Lower St. Helena Dam No. 16-2. Town of St. Helena, St. Helena, owner; earth, situated on tributary of York Creek, tributary to Napa River, located in Rancho Carne Humana.

PLUMAS COUNTY—Jamison Lake Dam No. 201. Carnation Gold Mining Co., Ltd., Blairsden, owner; earth, situated on Little Jamison Creek, tributary to Jamison Creek in section 1, T. 21 N., R. 11 E., M. D. B. and M.

RIVERSIDE COUNTY—El Casco Dam No. 822. G. O. Trauzettel, Redlands, owner; earth, situated on San Timoteo Creek, tributary to Santa Ana River in section 20, T. 2 S., R. 2 W., M. D. B. and M.

CONTRA COSTA COUNTY—San Pablo Dam No. 31-6. East Bay Municipal Utility District, Oakland, owner; earth, situated on San Pablo Creek, tributary to San Francisco Bay, located in Rancho El Sobrante.

SAN DIEGO COUNTY—Cuyamaca Dam No. 56. La Mesa, Lemon Grove and Spring Valley Irrigation District, San Diego, owner; earth, situated on Boulder Creek, tributary to San Diego River in T. 13, R. 4 E., S. B. B. and M.

SAN DIEGO COUNTY—Helix Dam No. 56-4. La

Mesa, Lemon Grove and Spring Valley Irrigation District, San Diego, owner; earth, located in section 21, T. 16 S., R. 1 W., S. B. B. and M.

SAN DIEGO COUNTY—Larger Lemon Grove Dam No. 56-7. La Mesa, Lemon Grove and Spring Valley Irrigation District, San Diego, owner; earth, located in section 25, T. 16 S., R. 2 W., S. B. B. and M.

SAN DIEGO COUNTY—Smaller Lemon Grove Dam No. 56-8. La Mesa, Lemon Grove and Spring Valley Irrigation District, San Diego, owner; earth, located in section 20, T. 16 S., R. 1 W., S. B. B. and M.

LAKE COUNTY—Buckshort Dam No. 392. Richard Detert, San Francisco, owner; earth, situated on Buckshort Creek, tributary to Putah Creek in section 9, T. 10 N., R. 6 W., M. D. B. and M.

SAN MATEO COUNTY—Flioli Dam No. 617. Flioli, Inc., San Mateo, owner; earth, situated on branch of Laguna Creek, tributary to San Mateo Creek in section 30, T. 5 S., R. 4 W., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources during the month of November, 1931.

LASSEN COUNTY—Loosely Pool Dam No. 258. T. H. Vestal, et al., Pittville, owner; concrete, 4 feet above streambed with a storage capacity of 120 acre feet, situated on Pit River, tributary to Sacramento in section 18, T. 37 N., R. 6 E., M. D. B. and M., for diversion purposes, for irrigation use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources during the month of November, 1931.

SONOMA COUNTY—Lawler Dam No. 581-3. Calif. Water Service Co., San Francisco, owner; earth, situated on Adobe Creek, tributary to Petaluma Creek in section 12, T. 5 N., R. 7 W., M. D. B. and M.

LOS ANGELES COUNTY—Greenleaf Dam No. 18. City of Whittier, Whittier, owner; earth, tributary to San Gabriel River in section 16, T. 2 S., R. 11 W., S. B. B. and M.

PLUMAS COUNTY—Eureka Dam No. 283. Plumas Eureka Corp., Grass Valley, owner; earth and rock, situated on Eureka Creek, tributary to Feather River in T. 22 N., R. 11 E., M. D. B. and M.

NAPA COUNTY—St. Helena Dam No. 16-2. Town of St. Helena, St. Helena, owner; earth, tributary to Napa River, located in Rancho Carne Humana.

CONTRA COSTA COUNTY—San Pablo Dam No. 31-6. East Bay Municipal Utility District, Oakland, owner; earth, situated on San Pablo Creek, tributary to San Francisco Bay, located in Rancho El Sobrante.

SHASTA COUNTY—Baldwin Dam No. 97-85. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on no stream.

MODOC COUNTY—Upper Caldwell River Dam No. 154-5. G. L. Kramer, Bebe, owner; flashboard, situated on Pit River, tributary to Sacramento River in section 34, T. 42 N., R. 10 E., M. D. B. and M.

PLUMAS COUNTY—Jamison Lake Dam No. 284-3. Carnation Gold Mining Co., Ltd., Blairsden; earth, situated on Little Jamison Creek tributary to Jamison Creek in T. 21 N., R. 11 E., M. D. B. and M.

MEETING OF RESEARCH BOARD

The eleventh annual meeting of the Highway Research Board, National Research Council, met December 10 and 11, 1931, in Washington, D. C. The sessions were devoted to discussions of reports of research activities in relation to highway finance, transportation, design, materials and construction, maintenance and traffic.

How State Cares for 130,000 Trees Privately Planted Along Highways

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THE PLANTING of many live Christmas trees on lawns and roadsides during the Christmas season brought requests for information as to the practice of the Department of Public Works relative to tree-planting by individuals and evidenced the widespread interest in this phase of roadside beautification.

The extent of this public interest in the arboreal beauty of our highways is best exemplified by the fact that since 1920, civic or other public bodies of California have planted nearly 700 miles of highway roadsides to trees. This represents nearly 70,000 trees. In addition, there were about 60,000 older trees which had been planted by tree lovers, making a total of 130,000 trees to be cared for by the maintenance forces.

The initial expense of planting and maintenance during the first year is borne by the parties interested. At the end of this period the State assumes their entire care, and replacement in event of loss.

The extent of this responsibility is appreciated, when it is known that some \$71,500 was expended during the past year for the care and replacement of the plantings, a sum representing 1.3 per cent of the total annual maintenance allotment.

AN EXACTING TASK

Generally the trees are spaced at 50-foot intervals, being placed alternately on the right and left sides of the roadway, with necessary elimination for visibility at crossings and road intersections. The care of these trees is very exacting and is usually assigned to the individual foreman in whose territory they occur. Assisting in the direction of this work is the arboriculturist, reporting to the maintenance engineer.

Special tree watering equipment having a movable discharge pipe enables watering to be done from the driver's seat, a tank truck of 1200 gallons usually being sufficient to water some thirty to forty trees. This watering must be performed every four to six weeks during the period from June to October. Aside from irrigation and cultivation many precautions are necessary for the protection

of young trees against insect pests, damage by squirrels, gophers, moles and loose stock driven along the highway. The hazard of fire is also great.

LOCATION IMPORTANT

Particular attention is given the location of plantings to eliminate any possible interference with the ultimate development of the pavement. With this in mind, new plantings are discouraged on rights of way less than eighty feet wide. On eighty-foot rights of way the trees are planted between the curb and right of way line, thirty-one feet out from the pavement center.

All roadside trees are inspected at intervals and particular note made of any trees within reach of the traveled way that are in any way a menace. Wherever hazard exists the trees are either removed, or trimmed and dangerous limbs cabled back to insure safety.

As load clearances require a clear height of 13½ feet above the pavement, systematic pruning and trimming are being followed to provide this clearance and at the same time develop a symmetrical, worth while tree. Where power or telephone lines occur within rights of ways planted to trees, the tree height is limited to 40 feet and all trimming for wire clearance is done by the utility company under permit and inspection of the Division of Highways.

SUITABLE SPECIES

Observations extending over a period of years indicate the suitability of the following tree species for the localities specified:

Valley sections: European Sycamore, California Black Walnut, Black Locust, Arizona Ash.

Coastal section: Coast Redwood, European Sycamore, Black Walnut, Blue Gum, Red Gum, Coast Live Oak, Silver Maple.

Desert section: Black Locust, Arizona Ash, Blue Gum, Red Gum, Black Acacia, Athol.

In addition to the care of trees, the Division of Highways organization is planting shrubs and vines on cuts and fills, particularly at subways and similar structures. In many cases, this work will reduce the upkeep cost at such locations.

State-wide Highway Developments Discussed at Annual Conference

THE MEETING of the State-wide Highway Committee of the California State Chamber of Commerce in connection with the annual conference at Los Angeles November 5-6, was one of the most comprehensive gatherings for discussion of highway development problems in California that the State has yet seen. With all sections of the State represented the meeting presented a cross section of all interests concerned in highway construction.

A roll call showed 84 in attendance including more than 30 county supervisors and representatives of the automobile clubs, various civic organizations and State and federal departments.

Earl Lee Kelly, chairman of the California Highway Commission, and Charles H. Purcell, state highway engineer, discussed the program and progress under the biennial budget.

FEDERAL AID MOTION

Dr. L. J. Hewes, deputy chief engineer of the U. S. Bureau of Public Roads, made a very complete report on the federal aid system, and Bruce B. Burnett, forest highway engineer, reported on the forest system. Following Dr. Hewes' report on the federal aid system, a resolution was passed as follows:

"That the State Chamber of Commerce urge the continuation of the present annual appropriation for federal and forest roads, and to take such measures as the Board of Directors may approve to aid in the accomplishment of this purpose."

Under the subject of additions to the secondary system, the method of procedure and the report of the progress made to date was explained by Mr. Purcell. Reports from Regional Councils indicated that the present policy of orderly additions based upon engineering studies, was being supported generally throughout the State, and that the regional highway committees are working in close cooperation with the Highway Department in the study of local projects.

Reports of the grade crossing study were made by W. K. Etter, manager of the Santa Fe Railroad Company; J. B. Hunter, trans-

portation engineer of the California Railroad Commission, and Harry A. Mitchell, president of the Sacramento Northern Railroad Company.

Mr. Mitchell made a notable report on the effective law enforcement in connection with grade crossings which resulted in a reduction of 16 per cent in grade crossing accidents for the first six months of this year compared with the same period last year. Following Mr. Mitchell's report, a resolution was passed commending him on the work done and the character of the report.

Orra E. Monnette, Colonel Charles Wing and Earl Lee Kelly reported very definite progress made by this committee on its present program for the designation and registration of historical land markers and the erection of suitable highway diversion signs. The committee is hopeful that historical highway diversion markers in California will have been erected prior to the 1932 Olympiad and is coordinating the work of various civic organizations engaged in this endeavor throughout the State.

BILL HURTS CALIFORNIA

A number of other important items such as the question of the State taking into the State highway system all city streets forming a direct connection to the State system, the inclusion of county roads in the State system, etc., were discussed. A number of these matters were referred to the State-wide Highway Committee for further study and recommendation.

A special subcommittee was appointed to study the effect of the Scott-Levitt Bill, which bill now provides that 90 per cent of the road on which expenditures can be made must be on public lands. This bill is working a particular hardship on approach roads to California national parks. In view of the immediate urgency for action on this matter, the committee requested that its chairman be authorized to take such action as necessary to protect California's interests.

Sunday School Teacher: Does any boy know what the children of Israel were looking for when they went into the wilderness?

Willie: Yes, ma'm. Parking space.—*Arizonian*.

Trunk Highway Protection Assured

(Continued from page 7)

Clearing of title to rights of way over lands involved in probate proceedings and over the property of minors always has been troublesome. Condemnation often has been resorted to in friendly cases in order to clear the title to the easement desired. An executor, administrator or guardian could execute a valid grant of right of way only after securing a court order authorizing a sale, advertising and taking of bids. Such procedure not only has increased the cost of rights of way which in numerous instances should have been donated, but has delayed many a highway project unnecessarily.

The two sections of the new Probate Code cited above permit executors, administrators and guardians to grant rights of way without consideration, whenever such a grant is for the advantage, benefit and best interests of the estate. The grant may be made upon an order of court after notice. Advertising and taking of bids, in the cases of such donations, is not necessary.

Such procedure will save much time and expense in many instances; right of way agents in the field should not fail to call these sections of the code to the attention of attorneys and other representatives of estates when dealing for such rights of way.

FEDERAL PROVISIONS

Section 17 of the Federal Highway Act, commonly called the Federal Aid Act, provides for the reservation of areas of public lands of the national government for rights of way and for sources of materials for federal aid highways, of which California has nearly 5000 miles.

As far as rights of way are concerned, in the past, advantage has not been taken of this offer of the federal government. Highways have been constructed across the public domain under the old act of 1866 which provides no definite width or method of giving notice to the Land Office that the grant has been accepted.

The General Land Office, in the Department of the Interior, recently announced that reservations of rights of way of a width of four hundred (400) feet would be made across unappropriated and unreserved federal lands whenever applications are submitted under Section 17.

The district offices were instructed by memorandum, in August, 1931, to clear the title to rights of way for all federal aid highways in California located across the public domain by submitting to headquarters necessary data for making such applications. This work is now under way and such applications are being forwarded to the Department of the Interior, through the Bureau of Public Roads of the Department of Agriculture, as provided by the federal statute.

Protection of the great interstate trunk highways from future encroachments and interference will thus be assured.

WITHIN NATIONAL FORESTS

Permits for the construction of highways through the national forests is another matter which has been given consideration. Formerly, applications for such permits were prepared in the district offices and forwarded to Sacramento for signature and submission to the Regional Office of the United States Forest Service in San Francisco. From the Regional Office they were returned to the local Forest Supervisor for review and recommendation before action was taken by the Regional Forester.

After a discussion of the matter with officials of the Forest Service, it was agreed that applications for such permits might be made by the district engineers and submitted directly to the supervisors of the forests involved. Thus, when the application arrives at the Regional Forest Office, it is accompanied by the report of the local Forest Supervisor.

PERMITS SPEEDED

Permits for use of road building materials to be obtained within the forests are handled in the same way. This procedure has relieved the central office at Sacramento of considerable unnecessary routine and has speeded up the issuance of such permits.

Cooperation also has been given to obtaining rights of way across Indian lands and various other Federal reservations, including reservoir and power site withdrawals. Federal rulings relative to such matters are being obtained and studied to the end that the procedure required by the Federal Government shall be followed in all cases.

Way to Kill the Goose That Lays Gold Highway Eggs

STATE SENATOR BREED does well to fight any suggestion to dip into the gas tax for purposes other than those agreed upon between the State and the motorists. The gas tax is going to need careful safeguarding or the goose that lays the highway eggs will be killed.

Hungry eyes turn constantly on the gas tax. Plots are being laid all the time. This tax turns out so much money, is collected so easily and so far has been extracted with so little pain to the subject that it is a great temptation to politicians seeking money to spend.

The vital point to remember is this: The gas tax is painless only because it is spent for the motorists. The moment any portion of the money is filched away from the highways the tax will become not only painful but tyrannical. The tax is a contract. The motorists agreed to it willingly on the explicit understanding that it was to be used solely for the roads. They will have a right to revolt if the money is diverted. The way to kill the gas tax is to load it with burdens for which the motorists, as motorists, have no proper responsibility.—*San Francisco Chronicle*.

Car's Serial Number Needed for License

A change in the forms of 1932 automobile registration certificates is announced by Russell Bevans, registrar of the Department of Motor Vehicles, to comply with a new section of the law requiring that the serial number and number of cylinders be stated on all applications for license renewal, transfers of secondhand cars and registration of new cars.

In applying for new plates the motorist should write in the number of cylinders after the line "Make" on the old certificate. The serial number should be written in below the line "Date Issued."

The city banker stopped at the village filling station for gas and then chatted with the proprietor while a young boy checked his tires and radiator.

"I suppose this hired man is your boy?" he said.
"That's not a hired man," said the villager, who had read of city banks, "that's our first vice president in charge of air and water."—*Exchange*.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
JOHN W. HOWE.....Editor

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Vol. 9 DECEMBER, 1931 No. 12

HEALTHY ROADS

A report to the American Chemical Society states that silicosis, an illness due to breathing dust, is more widespread than was hitherto believed.

Silicosis is caused by silica, a white crystalline substance composed of oxygen and silicon, the two most abundant elements in the earth's crust. They are believed either to dissolve in the lung or to form a colloid, a substance of glue-like consistency which floats in the lung tissue fluids. The resulting irritation creates scar tissue, and once established silicosis is permanent. The disease is usually progressive and frequently culminates in the dreaded tuberculosis.

Silicosis, of course, is most prevalent among industrial workers such as drillers and muckers in subways. But this menace to our health is faced, to a lesser degree, by all of us when we travel over dusty roads—and silica is especially plentiful in sand, of which many roads are partly composed.

This is just one more reason for pushing the good roads movement. Eliminating the dust and dirt by even inexpensively bound top surface, we have always known adds much to comfort, and we now learn it is an aid to health.—*Los Angeles Journal of Commerce*.

HER MISTAKE

Highway department stenographer: "Now, before we start this ride, I want to tell you that I don't smoke, drink or flirt. I visit no wayside inns, and I expect to be back home by 10 o'clock."

The new date: "You're mistaken."

Highway department stenographer: "You mean that I do any of those things?"

The new date: "No. I mean about starting for this ride."—*Texas Highways*.

"Honestly, that husband of mine is so exasperating! He asked me to meet him here with the car and I've been waiting ever since six o'clock—it's seven now!"

"What time were you supposed to meet him?"

"At five o'clock."—*Motor Land*.

Steam Heated Plant Protects Crew and Motors on Donner

(Continued from page 17)

at these locations and telephones installed. With the first sign of a severe storm, the gates are closed to all traffic and the equipment is lined up and ready to start.

It has been found that traffic not only is seriously in danger on Donner Summit during a storm, but that its movement interferes with the progress of snow removal work, as the equipment must be operated at high speeds and there is scant time to lend aid to motorists who get into difficulties at this time. When the storm is over and the roadway clear, the gates are opened.

At Other Points

While the severe conditions on Donner Summit require special equipment and organization, modern equipment is also maintained and operated as required at a number of other locations in addition to those mentioned. Snow is cleared on the main line of the Pacific Highway, the Ridge Route south of Bakersfield, the Redwood Highway east of Crescent City, and the State Highway between San Diego and El Centro, as well as the Red Bluff-Susanville, Redding-Alturas, Downieville and Trinity laterals.

For the benefit of those living in the valley who wish to enjoy the winter sports of the foothill region, an open road is maintained to Big Trees on the Ebbetts Pass road, to Riverton on the Placerville-Lake Tahoe road, and from Pooleys to Long Barn on the Sonora Pass road. Removal is also performed on the Crest Drive out of San Bernardino for those who seek their winter sports in the vicinity of Lake Arrowhead and Big Bear Lake, both lakes being above an elevation of 7000 feet. The equipment used on these routes varies from ordinary grading equipment to truck and tractor plows, both straight blades and rotaries.

Cost Per Inch

In all, twenty 4-wheel and ten 2-wheel drive trucks, seventeen 5-ton and seven 10-ton tractors are used, operating thirty-two push plows and seven rotaries of various types. During the past season over \$92,000 has been expended for the removal of snow at an average cost per inch mile of \$1.27.

The equipment and facilities provided cover some 600 miles of heavy snowfall area where there is normally sufficient snowfall to require the use of this equipment each winter to keep traffic moving.

At any time of severe storms we may be called upon to plow snow on an additional 1400 miles. The entire maintenance organization, with trucks, tractors, and graders, is available for such an emergency.

One of the best authorities on vacations advises that he would rather be sunburned on his vacation any time than get tanned on a week-end, especially if the latter is taken on a ranch.—*Texas Highways*.

And then there was the sweet young thing, taking the examination for a driver's license, who was asked: "If your brakes suddenly failed to work while you were going downhill, what would you do?"

She hesitated only a moment, then smiled brightly and answered: "Why that's easy; I'd jump out and put a big stone under the wheel."—*Motor Trades*.

New Alto-Waldo Road and Bridge Dedicated With Gala Pageantry

CALIFORNIA highway commissioners, officials and engineers took an active part in the double highway and bridge dedication ceremonies and celebrations Sunday, November 22d, when the new Alto-Waldo unit of Route 1, Redwood Highway over Richardson Bay was formally opened to traffic, following which the new hard surfaced portion from Tamalpais Valley to Marin Beaches was dedicated.

Earl Lee Kelly, chairman of the California Highway Commission and personal representative of Governor James Rolph, Jr., headed the official State party, which included Highway Commissioners Timothy Reardon of San Francisco and Harry A. Hopkins of Taft; Bridge Engineer Charles E. Andrew; District Engineer John H. Skeggs; Maintenance Engineer Fosgate and others.

Dedication and opening to traffic of these important highway units was the occasion for a colorful and spectacular celebrations in which several thousand men and women and hundreds of automobiles participated together with state, federal and county officials, representatives of chambers of commerce and civic organizations, and leaders of the entire San Francisco and north bay area.

Jointly Sponsored

The dedication was jointly sponsored by the Redwood Empire Association, the California Redwood Association, Marvelous Marin, Inc., and the Stinson Beach Progressive Club.

An outstanding feature of the dedicatory program was the christening of the Richardson Bay California Redwood bridge, built of California redwood timbers, which spans Richardson Bay, two miles north of Sausalito, by Mrs. Harry Lutgens of San Rafael, wife of the president of the Redwood Empire Association.

Under the direction of Charles Kenyon, chairman of a special committee named by the sponsors of the highway fete, a pageant depicting the evolution of highway transportation was staged as the crowning feature of the day's activities.

Indians on horseback, mounted Spanish vaqueros, cowboys, covered wagons, ox teams and other primitive means of transportation led the line of march.

Lunched at Beach

Harry G. Ridgway, president of Marvelous Marin, acted as master of ceremonies at the Alto-Waldo sector dedication.

Following the dedication of the Alto-Waldo sector a caravan of more than 200 automobiles was conveyed by a detachment of State highway patrolmen, under Captain A. F. O'Connor over the newly paved Shoreline unit to Stinson Beach, where a picnic luncheon was served under the willows and a second dedicatory program staged, with Newman Fitzhenry, of the Stinson Beach Progressive Club, garbed as a Spanish Don, acting as master of ceremonies.

Music was furnished at both programs by the bands of the Tamalpais Union High School and the San Rafael High School, while the uniformed drum corps of the Native Sons and the Native Daughters of the Golden West added to the color of the occasion.

Participants in the pageant included students of the two high schools, members of the Order of Red Men, the American Legion and of various Marin County service clubs and organizations.



A MONUMENT OF REDWOOD is this new bridge across an arm of Richardson Bay on the recently opened Alto-Waldo unit of Route 1, Redwood Highway. Most appropriately, it is built almost entirely of redwood timbers. More than 2,000,000 feet of this fine product of California's forests was used in its construction, only the central drawbridge span requiring resort to steel. The road was opened with appropriate dedication ceremonies on November 22 and the bridge duly christened Richardson Bay California Redwood Bridge by Mrs. Harry Lutgens wife of the president of the Redwood Empire Association.

Plan Better Roads for Baja California

Proposed highway improvements in Lower California, Mexico, are set forth in an announcement by Governor Augustin Olachea, the recently appointed head of Mexico's peninsula state.

Among the road projects named by the Mexican executive are construction of a highway between Tijuana and Ensenada; improvement of 850 miles of road between Tijuana and La Paz; paving of roads below the border in accordance with San Diego County highway standards, to conform to that county's highway system; and to provide extensions into the northern part of Lower California.

Salesman: Do you prefer a sedan or a roadster?

Customer: I really can't say.

Salesman: I understand. I'm married myself.

First bridge player: But I understand that Jane married a model husband.

Second bridge player: That's what she thought at the time, but he turned out to be a sport model.—*Exchange.*

ARCHITECTURAL AWARDS

For Month of November

State Printing Plant, Sacramento—Addition to plant; ventilating work to Carpenter and Mendenhall, Sacramento \$63,330; for complete plumbing, heating and ventilating work to Carpenter and Mendenhall, Sacramento, \$11,900; for electrical work to M. P. Canon, Sacramento, \$10,475.

Sonoma State Home, Eldridge—Repairs to boiler setting, awarded to Dee Engineering Company, San Francisco, \$595.

Sonoma State Home, Eldridge—Fire house: contract for general work to Petaluma Construction Company, Petaluma, \$10,975; for complete plumbing and heating to Ray Kynoch, Petaluma \$1,999; for electrical to Karl F. Stolling, Santa Rosa, \$558.

Pacific Colony, Spadra—Water well, contract to Lyon Bros. of Los Angeles, \$2,800.

Agnews State Hospital—Water tower, to J. F. Shepherd, Stockton, \$22,900.

Norwalk State Hospital—Ward No. 20; contract for general work to W. J. Esser, Long Beach, \$39,675; for plumbing to Hickman Bros. San Pedro, \$5,058; for electrical to Walter H. Smith, Long Beach, \$1,515; for heating to Walter H. Smith, \$8,495.

Mendocino State Hospital, Talmage—Laundry building; for general work to The Minton Co., Palo Alto, \$20,576; for combined heating and plumbing, to The Turner Co., San Francisco, \$3,523; for electrical work to Superior Electric Co., San Francisco, \$1,880.

The difference between Lot's wife and the lady driver is this: The former looked back and turned into a pillar of salt. The latter looked back and turned into a telegraph pole.—*Laughing Gas.*

Ten Parties to Measure Flood Control

(Continued from page 31)

which a maintenance headquarters will be erected at an estimated cost of \$10,500. The work of grading is to be commenced at once.

Sacramento Flood Control.

The Reclamation Board has requested this department to undertake clearing work in the Yolo By-pass along the Southern Pacific railroad at a cost of \$1,000, under section 21 of the Reclamation Board Act.

Emergency Flood Control and Rectification of Rivers.

Work has commenced on the continuation of the river rectification on the San Jacinto River, to cost about \$6,000, two-thirds of which is contributed by local interests.

Arrangements have been made for immediate commencement of clearing in the channel of the Santa Ynez River, in cooperation with the county of Santa Barbara. A total of \$3,000 will be expended.

Mokelumne River.

Clearing in the Mokelumne River channel, under Chapter 447, Statutes of 1929, has been carried on in collaboration with San Joaquin County. A total of about \$5,000 will be expended.

Pajaro River.

Clearing in the Pajaro River channel, under Chapter 524, Statutes of 1929, has continued during this period. The total cost of this work will be \$4,000.

Russian River Jetty.

The construction of a 12-ton derrick in the quarry has been completed and two 20-ton gear dump rock cars have been secured. Stones ranging in size from 6 to 12 tons are now being placed in considerable numbers in the jetty, most of the rock, however, ranging in size up to 5 tons, being handled in the old 6-ton cars. The rock work has continued during the entire period.

Flood Measurements and Gages.

Preparations are complete for taking flood flow measurements if they are required, equipment being complete for ten field parties. Routine care of the water stage recorders maintained by the office is being continued.

WATER RIGHTS

Applications to Appropriate.

During the month of October, 24 applications to appropriate water were received, 16 were canceled, 19 were approved and 8 permits were revoked.

The applications received included one by Consolidated Irrigation District proposing an appropriation from San Joaquin River in Fresno County for power purposes at an estimated cost of \$10,000,000. Another application of unusual importance was one filed by John W. Bergin, proposing an appropriation from Willow Creek, tributary of Trinity River, in Humboldt County, for mining purposes at an estimated cost of \$150,000. A rather unusual application was received from Stanislaus National Forest proposing appropriations by means of storage in Lower Buck Lake, Long

Lake, Emigrant Meadow Lake, Emigrant Lake, and Bigelow Lake at the head waters of tributaries of Tuolumne River in Tuolumne County for the purpose of increasing the summer flow at the headwaters of these streams for the maintenance of fish life and other recreational purposes. The application of J. L. Blossom and F. M. Lamb, proposing to appropriate from North Canal, a branch of the Middle Branch of the San Joaquin River in San Joaquin County, for the irrigation of 1200 acres at an estimated cost of \$14,000 was approved as was also an application by O. C. Cutts proposing an appropriation from San Joaquin River in San Joaquin County for the irrigation of 79 acres at an estimated cost of \$10,000.

In response to the request for progress reports forwarded to permittees and licensees a total of 851 reports were received during the month.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the Superior Court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the Superior Court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County). The North Cow Creek case came up for hearing in the Superior Court of Shasta County on October 26, 1931. The matters at issue were settled by stipulation and entry of the Court's decree is now pending.

Oak Run Creek (Shasta County). Case pending in the Superior Court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County). The Clover Creek case has been set for hearing January 18, 1932, in the Superior Court of Shasta County.

Butte Creek (Siskiyou County). Case pending in the Superior Court of Siskiyou County awaiting action by the parties involved.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). The Division's report as referee, containing a proposed decree, was filed with the Superior Court of Modoc County on November 17, 1931.

Deep Creek (Modoc County). The Division's report covering the distribution of the waters of Deep Creek, in accordance with the trial schedule of allotments adopted for the 1931 season, is in the course of preparation.

Franklin Creek (Modoc County). The Division's report on the distribution of the water of Franklin Creek for the 1931 season is being prepared.

New Pine Creek (Modoc County). The report on the water supply and use of water on New Pine Creek, covering the field investigation conducted on that stream during the 1931 season, has been commenced.

Eagle Creek (Modoc County). The report on the water supply and use of water on Eagle Creek is being prepared.

Pit River (Modoc and Lassen Counties). The reports on the supervision of diversions from Pit River

Sacramento Delta Salinity Recedes

(Continued from preceding page)

in South Fork Valley, Hot Springs Valley and Big Valley for the 1931 season are being prepared.

Little Shasta River and Lower Shasta River (Siskiyou County). Reports covering water master service on these streams during the 1931 season have been partially completed.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The regular field work comprising measurements of all diversions, stream flow and return water throughout the Sacramento-San Joaquin territory, was practically completed at the first of November and the office work in preparation of the 1931 report is now in progress.

The special field investigation to determine the extent of damage both in the up-river territory and throughout the Delta due to the 1931 water shortage and salinity, is still in progress. The obtaining of production and yield data required to complete the investigation and the necessity for contacting the large number of landowners throughout the Delta have prolonged this work.

On November 1 the flow of the Sacramento River at Sacramento had increased to 6900 second-feet and the San Joaquin River near Vernalis was flowing 600 second-feet, making a total discharge of 7500 second-feet to the Delta.

The salinity has been slowly receding in the lower Sacramento River Delta but has remained almost at a standstill in the middle San Joaquin Delta. During the past month the recession in salinity has permitted the discontinuance of sampling at Howard Ferry, Sutter Slough, Little Holland Ferry, and Tyler Island Ferry in the Sacramento Delta and at Durham Ferry Bridge, Brandt Bridge and Whitehall in the upper San Joaquin Delta. At present, sampling is being conducted at forty-seven channel stations and six interior drainage stations. The accompanying table shows the comparison between the salinity at the middle of October and November of this year and at the middle of November, 1924.

SALINITY—SACRAMENTO-SAN JOAQUIN DELTA

Station	Parts of Chlorine per 100,000			
	10/14/31	11/14/31	11/14/24	
O and A Ferry-----	1140	815	166	
Collinsville-----	830	525	66	
Three Mile Slough Bridge-----	375	246	16	
Rio Vista Bridge-----	292	128	5	
Isleton Bridge-----	177	4	4	
Antioch-----	785	535	70	
Webb Pump-----	400	185	88	
Central Landing-----	99	73	16	
Middle River Post Office-----	229	198	114	
Rindge Pump-----	155	84	32	

CALIFORNIA COOPERATIVE SNOW SURVEYS

During the past month, all field work in contacting the various cooperating agencies, stocking shelter

cabins, distribution of equipment and forms, and layout of new snow survey courses in preparation for the 1932 Spring surveys has been completed.

A trip was made to Mono and Owens rivers basins to check over, re-mark and prepare sketches for permanent record, all snow courses surveyed in cooperation with Southern Sierras Power Company.

In the Yuba and Feather basins a trip was made to complete the stocking of shelter cabins and the Webber Lake and Webber Peak courses were brushed out, re-marked, and sketched.

Contact was made with the personnel of the Nevada cooperative survey to complete the arrangements for the Nevada-California surveys.

A reconnaissance was made in the American River Basin and new snow survey courses were established in the Silver Creek drainage at Icehouse and on the Silver Creek-Rubicon divide at Loon Lake, Gerle, Orelli's and Long Meadow. Arrangements were completed for the initial survey of these courses in 1932.

WATER RESOURCES

Ventura Investigation. The principal feature of this work during the month has been the drilling of dam sites. Drilling has been completed on the Devil and French Flat reservoir sites and work is now in progress on the Blue Point site.

Salinas Valley Investigation. A large amount of preliminary data have been gathered on water levels, locations of wells, reservoir sites and methods best adapted to prosecuting the work.

Pit River Investigation (Modoc and Lassen counties). Work on the report covering the three years investigation, October 1, 1928, to October 1, 1931, was continued throughout the month. Compilation of the stream flow and diversion records collected during the 1930-1931 season has been completed.

Napa Valley Investigation. This investigation continued throughout the month in a routine way with the reading of typical wells throughout the valley and the measurement of stream flow.

Santa Clara Valley Investigation. A resurvey of the ground water level throughout Santa Clara Valley was made on November 5, 6 and 7, which indicated a recovery of 0.8 foot on the average since September 17. There was, however, a considerable variation in different wells, the maximum recovery recorded in any instance being 40.3 feet and the maximum recession 15.4 feet.

STATE WATER PLAN

The members of the California Water Resources Commission have been actively engaged during the past month in a study of the State-wide plan for conserving California's water resources, and an orderly method for their distribution and utilization.

The Commission met at the State Building, Civic Center, San Francisco, on October 23 and arranged a series of public meetings. These meetings were held jointly with the California Joint Legislative Water Committee in the U. S. Grant Hotel, San Diego, November 2; Mission Inn at Riverside, November 3; and in the Railroad Commission Courtroom, Los

Water Meetings in South Bring Out Large Attendance

(Continued from preceding page)

Angeles, on November 4 and 5. In addition to these meetings, on November 3 members of the California Water Resources Commission and the Joint Legislative Water Committee were guests of the San Gabriel Associated Chambers of Commerce at a dinner given at the Elks Club, Monrovia, and at a dinner as guests of the Water Committee of the California State Chamber of Commerce held at the Hotel Alexandria on November 5.

These meetings were programmed by the two bodies in order that they might hear from the citizens of the southern part of the State regarding their local problems of water shortage and receive recommendations as to methods by which the water resources of this area may be conserved and utilized. Evidence that the critical nature of California's water problem is being widely recognized and that the solution must come from a State-wide program of water conservation was shown by the public interest and attendance at these meetings held in southern California by the Governor's Water Commission and the Joint Legislative Water Committee on November 2, 3, 4 and 5.

SAN DIEGO SUPPLY

At San Diego, data were submitted on the flood control and domestic water supply problems of San Diego and the surrounding area.

Representatives of Fallbrook irrigation district and La Mesa irrigation district, both adjacent to San Diego, presented the difficulties encountered in their efforts to secure additional water supplies.

At Riverside on November 3, representatives appeared in behalf of water conservation for Orange, San Bernardino, Riverside and Imperial counties.

Problems of the Mojave River Basin were presented by the San Jacinto Flood Control Association. The problems of the Santa Ana River Basin were presented by Mr. Francis Cattle, president of the Water Conservation Association of San Bernardino, Riverside and Orange counties, while Mr. Chas. Childers, attorney for the Imperial irrigation district, explained the problems confronting Imperial County and the Imperial irrigation district.

LOS ANGELES MEETINGS

On November 4 and 5, the last of the series of joint meetings was held in Los Angeles. At these hearings water problems in the region of Ventura, Santa Barbara, San Luis Obispo, Mono County, Inyo County and Los Angeles County were heard.

The Honorary Advisory Committees recently appointed by Governor Rolph for a study of the State-wide plan have given excellent cooperation and made rapid progress. Conferences were held in the State Engineer's office on November 16 and 17 with the subcommittee of the Honorary Engineering Advisory Committee, consisting of Messrs. J. B. Lippincott, B. A. Etcheverry and R. V. Meikle. Engineering data and recommendations included in the report to the Legislature of 1931 were reviewed and a report will be rendered by this subcommittee to the Honorary Advisory Committee of Engineers.

Studies are being continued on a tentative draft of a proposed constitutional amendment under which the State Water Plan may proceed to realization.

Governor Wields a Shovel at Ground- Breaking Ceremony

GOVERNOR James Rolph, Jr., stepped down from the speakers' platform to turn the first shovelful of earth in the official ground-breaking ceremony for an addition to the State Printing Plant on O Street, Sacramento.

He peeled off his coat, seized a shovel and dug in. Before he could lift the shovelful, an official of a local labor union stepped from the crowd and stopped him. He asked the Governor if he had a union card. The Governor, not a bit nonplussed, pulled out a wallet, extracted a union card and showed it. He added with some pride that he could show cards of a number of other unions and that every garment he wore bore a union label.

Governor Rolph then proceeded to load a wheelbarrowful of earth, haul it away and dump it.

The ground-breaking ceremony on December 23d was attended by a crowd of citizens, print shop employees and city, county, State and Federal officials including Mayor Bidwell of Sacramento; City Manager James S. Dean; Postmaster Harold J. McCurry; Director of Agriculture Dudley Moulton; Director of Public Works Walter E. Garrison; Deputy Director James I. Herz; Chief E. Raymond Cato of the California Motor Patrol; State Architect George B. McDougall and J. M. Welsh, superintendent of the State Printing Plant, representing Harry Hammond, State Printer.

Colonel Garrison acted as chairman and introduced the Governor and the other speakers. In his speech Governor Rolph said it was an inspiration to be present at the commencement of construction of a building that would give employment to hundreds of men and women at a time when the hearts of men were sorely tried and public officials were being tested as they never had been before in trying to perform the duties placed upon their shoulders in the State capital.

He was hopeful that the occasion also marked the turning of the tide toward better times when men would again be prosperous and happy in their work.

The new building will be a three-story steel and concrete structure costing \$120,000.

Judge: You *know* you were traveling less than 25?
Defendant: I *know* I was—I didn't hear a word from the back seat.

How a Good Barber Became a Better Blue-print Maker

FROM head barber to head blue-print maker for the State of California is some leap vocationally speaking but it was successfully made by Frank J. Butler presiding genius of the blue-print room on the fourth floor of the Department of Public Works headquarters. His story is a romance of politics.

Butler started in the barbering business in Sacramento in 1876, opening the old Ale Vaults Barber Shop near the southeast corner of Third and J streets. Later he ran the Golden Eagle shop and subsequently the Capital Hotel shop. He was a good barber and a good "mixer." His shops became a rendezvous for the social and political celebrities of the day. Especially during legislative sessions were they the meeting-place for men whose names were as familiar as household words in the Golden State. Frank knew them all and called most of them by their first names.

CALLS HIM HIRAM

Among them was Hiram Johnson. Frank had given him his first hair cut as a boy and his first shave. When Johnson became Governor he insisted that Frank give up barbering and become his office messenger at the Capitol.

"I told Hiram I was doing very well and didn't think I'd like the job," says Frank. "'Well, you come on over. I know you'll like it, and I want you,' he said. Well, I didn't like the office work and told Hiram I wanted to quit. 'Go up and try the blue-print room. I think you'll like it up there,' replied Hiram.

"I didn't know anything about blue-prints but I went down to a big firm in San Francisco and learned all about how to make them. Then I came back and told Hiram if he'd fix me up with a modern continuous press I'd take the job and save money for the State."

HIE MADE GOOD

That was twenty-one years ago. Butler took the job, got the press and made good both in word and deed. It was costing the State twenty cents a sheet and he reduced the cost to eight cents. Work piled up and he got a second press and an assistant. Now both can't keep up with the growing demand.



BLUE PRINTER but he's not blue. Frank J. Butler, chief of the blue-print room in the Public Works Department, is as cheery and genial as he was twenty-one years ago when his friend Hiram Johnson, then Governor, induced him to close his barber shop and accept service with the State.

WATER PERMITS ISSUED

(Continued from page 32)

SIERRA COUNTY—Permit 3817, Application 7601. John J. Connell, c/o R. F. Taylor, Downville, Sierra Co., November 24, 1931, for 0.10 c.f.s. from Swansea Tunnel, tributary to Swansea Ravine, thence to Middle Fork of Yuba River in section 3, T. 18 N., R. 10 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$200.

MENDOCINO COUNTY—Permit 3818, Application 7617. Miss Frieda Larnett, Gualala, Mendocino Co., November 24, 1931, for 237 gallons per day from Sea Side Stream, tributary to Pacific Ocean in section 21, T. 11 N., R. 15 W., M. D. B. and M., for domestic purposes. Estimated cost \$500.

TUOLUMNE COUNTY—Permit 3819, Application 7623. State of California, Division of Highways, Sierra No. 10, Sacramento, November 24, 1931, for 0.005 c.f.s. from Stoddard Spring. Estimated cost \$200.

INYO COUNTY—Permit 3820, Application 7614. John Amick, Independence, Inyo Co., November 28, 1931, for 0.50 c.f.s. from Barrel Spring tributary to Mazourka Canyon, thence to Owens River in section 29, T. 12 S., R. 36 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$800.

INYO COUNTY—Permit 3821, Application 6428. C. H. Darenso and Edward Schober, 514 Commercial Exchange Bldg., Los Angeles, November 30, 1931, for 0.50 c.f.s. from unnamed spring, Grape Vine Spring, tributary to no stream in sections 10 and 15, T. 21 S., R. 39 E., M. D. B. and M., for domestic and irrigation of 40 acres. Estimated cost \$5,000 to \$8,000.

District Six Reports Progress of Varied Road Improvements

By E. E. WALLACE, District Engineer

THE construction of three bridges and an overhead grade separation are among the important improvements now under way in District Six which embraces six counties. The projects advanced in the various counties are as follows:

KERN COUNTY—Improvement between Grapevine and Bakersfield, a distance of 30 miles, consisting of widening roadbed to 36 feet and placing 6-foot cut-back shoulders on each side of the 20-foot pavement has been completed.

PAVEMENT WIDENED

TULARE COUNTY—Placing of $3\frac{1}{2}$ miles of cut-back rock borders from the west line of Tulare County on Route No. 10 about nine miles east of Hanford has been completed and is considered a desired improvement. This resulted in widening the old 15-foot pavement to a width of 21 feet.

Between Tipton Crossing and Tulare, a distance of 7.6 miles, work is progressing on new location east of the Southern Pacific Railroad, which is designed to eliminate two grade crossings.

Bridges and concrete structures are progressing very rapidly and grading is in progress.

Contract between Goshen and Kingsburg, involving widening of roadbed to 36 feet, and resurfacing to 20 feet, has been practically completed with the exception of the shoulder oiling. This improvement has greatly increased safety to traffic due to the widened roadbed and pavement and the elimination of the dangerous shoulder conditions.

SAFER HIGHWAY

The southerly half of the project passes through alkali land and the soil is extremely dangerous during wet weather. As the new improvement involved a large amount of embankment, it was possible to import a better grade of soil for the shoulders and by oiling the shoulders 8 feet in width beyond the pavement edge, there is practically 36 feet of roadway which is in good condition for travel, even in wet weather.

FRESNO COUNTY—Work is progressing with satisfactory speed on Kings River Road, even in the face of adverse weather conditions. Over 5 feet of snow has fallen in the higher elevations, although there is considerably less at the point where construction operations are in progress. A new 1½-yard Diesel shovel arrived at Camp No. 19 on December 10, 1931, and will soon be in operation. Very low temperatures have prevailed, the camp having reported 8 degrees below zero on several occasions.

COMPLETING BRIDGE

MADERA COUNTY—New bridge over the Fresno River north of Madera is practically complete and is understood will be ready for acceptance in the very near future.

Bids were opened for completing the line change and approaches on December 9, 1931.

MERCED COUNTY—Work of constructing an

In Memoriam

W. B. MATHEWS, member of the California Water Resources Commission, passed away December 9, 1931.

Mr. Mathews was appointed by Governor James Rolph, Jr., on August 24, 1931, to this Commission, known as the Governor's Citizens Water Commission. The State's loss occasioned by the passing of this eminent citizen has been fittingly expressed by the Governor.

"In the death of Mr. W. B. Mathews, the Nation and the State have suffered an irreparable loss. No man has contributed more to the solution of the tremendous water problems of California and indeed of the entire Southwest than Mr. Mathews.

"As general counsel of the Bureau of Water and Power of the City of Los Angeles he bore a vitally important part, in the face of apparently unsurmountable obstacles, in obtaining for that city its present water supply.

"When it became evident that this supply was inadequate for future needs, he was a leader in the organization and successful development to date of the great Metropolitan Water District, formed to bring into Southern California from the Colorado River a supply of water adequate for its needs for all time.

"With all of these tremendous problems of more or less local interest he still found time to contribute of his great ability and energy to the solution of the entire Colorado River development and the project for State-wide development of the water resources of California.

"He served as a Member of the Colorado River Commission, the Federal-State Water Commission for California, and at the time of his death was actively engaged as a member of the present State Water Resources Commission. In February last he was a member of the Commission sent by me to Washington to present the general water problem of California to the Federal Government.

"To all of these great services he brought splendid ability, untiring energy, and a high ideal of civic duty and responsibility. It will be difficult, if not impossible to replace him in the work which remains to be done, but he leaves behind accomplishments priceless to his community and the State."

overhead grade separation 2 miles east of Merced on the Yosemite Lateral, Route No. 18, is nearing completion and will probably be open to traffic on January 1, 1932.

Work of constructing three bridges at the San Joaquin Overflow and High Line Canal, east and west of Los Banos is now in progress under supervision of the Bridge Department.

MARIPOSA COUNTY—Good progress is being made in grading new location between Orange Hill School and Pain Flat.

STATE OF CALIFORNIA

Department of Public Works

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C. C. CARLETON, Chief
FRANK B. DURKEE, General Right of Way Agent
C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor
Port of San Jose—Not appointed
Port of San Diego—Edwin P. Sample



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

MAP
SHOWING
STATE HIGHWAY SYSTEM

1931

LEGEND

Primary Roads ———
Secondary Roads - - - - -

Seattle Public Library







